

The Refrigeration Service Engineer

VOL. 14 NO. 11

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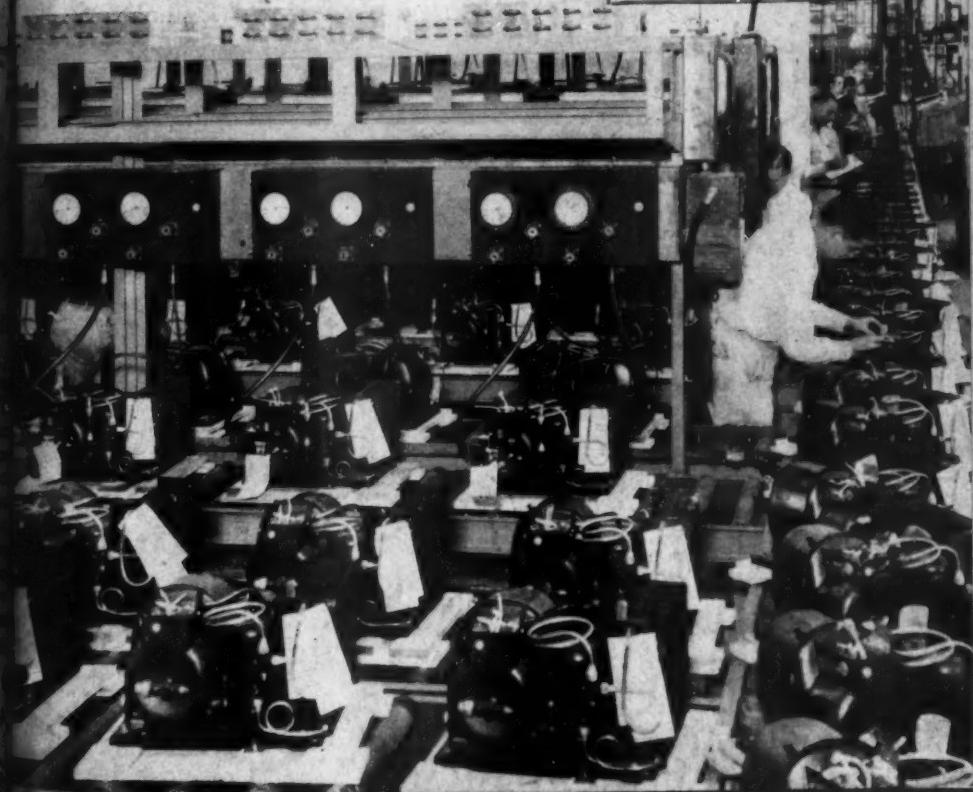
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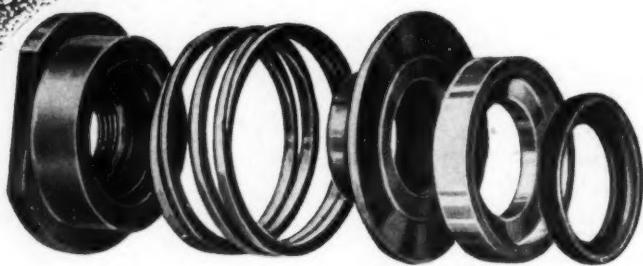
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DETROIT



A.S.E.S. Convention—NAIAC Meeting
—All-Industries Exhibition Report
Record Membership Interest

Chicago
CHICAGO SEAL
Announces
NEW
REPLACEMENT SEALS
NOW FOR SERVEL COMPRESSORS



FOR BETTER PERFORMANCE USE

**CHICAGO
VALVE PLATES**



**CHICAGO
SEALS**



CHICAGO SEAL CO. 20 N. WACKER DR., CHICAGO 6, ILL.



REFRIGERATION'S BIGGEST PROBLEM!

DRYING POWER OF VARIOUS MATERIALS

Drier	Refrigerant	Liquid or Vapor	Max. Residual Water Concentration After Passage through Drier.	
			.23% Initial Water Concentration	.03% Initial Water Concentration
ACTIVATED ALUMINA	Sulfur Dioxide	L	.15	.085
	Methyl Chloride	V	.01	.006
SILICA GEL	Sulfur Dioxide	L	.15	.006
	Methyl Chloride	V	.01	.004
DRIERITE (Calcium Sulphate)	Sulfur Dioxide	L	.15	.009
	Methyl Chloride	V	.08	.003
CALCIUM CHLORIDE CaCl ₂	Sulfur Dioxide	L	.09	.013
	Methyl Chloride	V	.04	.005
CALCIUM OXIDE CaO	Sulfur Dioxide	L	.20	—
	Methyl Chloride	V	.15	—
BARIUM OXIDE BaO	Sulfur Dioxide	L	.20	.017
	Methyl Chloride	V	.05	.006

IMPORTANT QUESTIONS IN SELECTING A DRIER

1. Does the material dry the refrigerant below the corrosion limits when placed in the liquid line? In the suction (vapor) line?
2. Does the material dry the refrigerant below the limits for ice formation with methyl chloride and the "Freon" refrigerants?
3. Does the material accomplish the drying in one passage of the refrigerant, or is it slow, i.e., requires several passages?
4. Does the material deteriorate in physical character in handling or when it removes water from the refrigerant?
5. Does the oil affect the drier adversely?
6. Does the drier corrode?

ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

ANSUL CHEMICAL COMPANY

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINSTON'S FREON 11, FREON 12, FREON 21, FREON 22, AND FREON 111



SEND FOR THIS BULLETIN

An informative reprint, "REFRIGERANT DRIERS," will be sent on request. No obligation. Send for it today.

ANSUL WHOLESALERS are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.



New "DETROIT" No. 573
THERMOSTATIC EXPANSION VALVE



"DETROIT"

All the Reliability of No. 673 for Smaller Installations

The latest addition to the "Detroit" line of Expansion Valves is No. 573.

Tests show it has the sturdy performance of the No. 673. It is designed for small commercial installations and one such develops operating characteristics superior to single diaphragm valves at no penalty in cost. It has a two diaphragm gas charged power element offering gas charging in its simplest, most effective form—a single efficient power element.

Try these valves on your next suitable job. They provide the same trouble-free control as the No. 673.

CAPACITIES OF NO. 573 VALVE

Rated at $\frac{1}{2}$ -ton Freon-12, or .9 ton Methyl

UNIT NUMBERS OF NO. 573 VALVE

(Stock Items with Your "Detroit" Jobber)

Unit No.	Refrigerant	Max. Pressure	Connection
57300	Freon-12	45	Inlet $\frac{3}{8}$ " SAE for
57309	Freon-12	10	$\frac{3}{8}" \times \frac{1}{4}"$ reducing nut
57311	Methyl	35	Outlet $\frac{1}{2}$ " SAE for
57315	Methyl	5	$\frac{1}{2} \times \frac{3}{8}$ " reducing nut

Use "Detroit" Unit Numbers When Ordering

See This Valve at Your
"Detroit" Wholesaler's

DETROIT LUBRICATOR COMPANY General Offices: 3500 TRUMBULL AVENUE
DETROIT 8, MICHIGAN

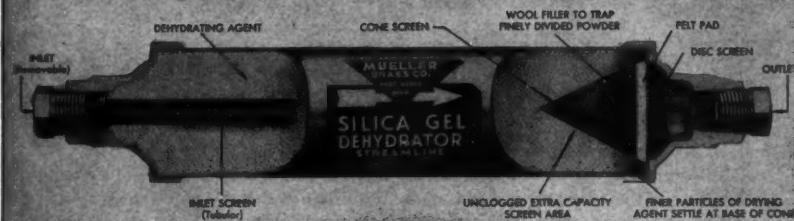
Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Canadian Representatives: Railway and Engineering Specialties Limited, Montreal, Toronto, Winnipeg



For more information on Detroit Lubricator Company products, write to: Detroit Lubricator Company, 3500 Trumbull Avenue, Detroit 8, Michigan. Safety
Valves and Oil Burner Accessories • "Detroit" Expansion Valves and

Here is the New
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REFILLABLE DEHYDRATOR



**Readily Removable Inlet
 For Easy Refilling!**

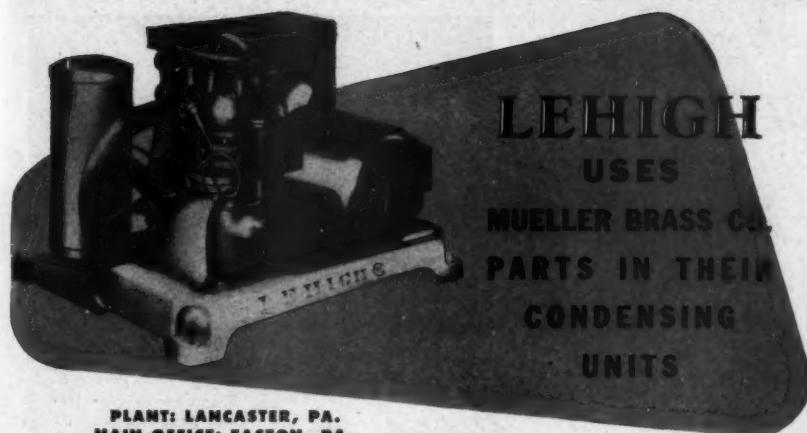
When recharging our new Dehydrator, simply remove the inlet plug . . . back out the slotted inlet screen tube . . . shake out the exhausted agent, then replace with new.

In addition to this convenient feature (see illustration above) Mueller Brass Co. Filters and Driers are provided with the CONE SCREEN OUTLET, a specially designed filtering element that adds immeasurably to the life and efficiency of Driers and Filters.

Fine crystals or powder, which continually break away from the Dehydrating Agent, are forced to the base of the cone, leaving the center and tip of the screen open for the free flow of refrigerant. The cone screen itself is filled with pure wool which traps any particles that are sufficiently fine to pass through the screen mesh.

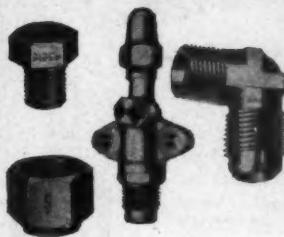
Particular attention has been given to screen areas in Mueller Brass Co. Filters and Driers so that each size permits efficient passage to the maximum refrigerant volume that is used in a particular size refrigerant line.

MUELLER BRASS CO. PORT HURON, MICH.



PLANT: LANCASTER, PA.
MAIN OFFICE: EASTON, PA.

LEHIGH Foundries, Inc.



BUILT-IN QUALITY TIME-TESTED PERFORMANCE

Mueller Brass Co. Valves, Fittings and accessories are sturdy and dependably built. They have a well-earned reputation for built-in quality and time-tested performance.

The Mueller Brass Co. line of refrigeration products is exceptionally complete, and all products are designed and manufactured specifically for mechanical refrigeration work. THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES.

OBVIOUS CONCLUSION: Mueller Brass Co. products must be good!

MUELLER BRASS CO.
FORT HUON, MICHIGAN

The "Lehigh Team" GOES ALL OUT FOR QUALITY

Lehigh's familiar advertising characters, the hustling, smiling "Lehigh Team", are glad to credit Mueller Brass Co. valves and fittings with an important share of the Lehigh quality story. The many acre, straightline Lehigh plant at Lancaster, Pennsylvania, utilizes the most modern, high speed, volume production methods—and in turn demands the best from its specialty suppliers.

Lehigh Heavy Duty Condensing Units, equipped with Mueller Brass Co. valves and fittings have gained the respect and admiration of the refrigeration industry for their modern design, remarkable compactness per H. P., their smooth, quiet operation, and the quality of every detail in their construction.

MUELLER *Lehigh "M & E"*

Two Names That Are Helping
To Improve the Science of Refrigeration

1



V - METH - L is
tested for moisture . . .

2



. . . then tested
for boiling point . . .

3



. . . and finally
for acidity.

*Triple-Tested
purity for
Service Surety*

VIRGINIA Refrigerants are produced under rigid laboratory control. V - METH - L (Methyl Chloride) is subjected to the three separate tests pictured at left. ESOTOO (Liquid Sulfur Dioxide) and other VIRGINIA products are made under similar conditions of continuous testing. Specify VIRGINIA Refrigerants . . . get "tested PURITY for service SURETY."

Distributors of
"Freon" Refrigerants
11, 12, 21, 22, 113



VIRGINIA

SMELTING COMPANY

WEST NORFOLK, VIRGINIA
NEW YORK • BOSTON • DETROIT



A YET THE MAN WHO WANTS ONE FLARING TOOL
for all sizes of tubing $\frac{1}{8}$ " to $\frac{3}{4}$ " O.D.

IMPERIAL FLARING TOOL



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Simply slip yoke over top of bar. Inside edges are slotted so that a slight turn holds it in place.

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Fittings • Valves • Dehydrators • Filters •
Floats • Charging Lines • Tools for Cutting,
Flaring, Bending, Coiling, Pinch-off, Swaging.

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DU PONT
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WAX
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99.5% DRY • UNIFORM

HIGH-PURITY Du Pont Methyl Chloride will meet your refrigeration requirements.

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Acid as (HCl)	0.001% by wt. max.
Residue on Evaporation	0.01% by wt. max.
Boiling Range (760mm)	—24.6° to —23.6°C.
Color.....	water white, clear



*All Right...
where does
the Moisture
go?*

THAWZONE DATA

"It sure worked on that job," says Mr. Service Engineer. "But where does the moisture go when THAWZONE acts on it?"

"We'll try to explain," we say. "But please bear with us if our explanation sounds complicated."

Water has the chemical formula H₂O. Chemically, however, it generally behaves as if it were made up of two parts: an H⁺ (positive hydrogen ion) and an OH⁻ (negative hydroxyl ion). There are various compounds that interact with water to split it up this way. Most of them are unsuited to a refrigeration system.

THAWZONE, however, is a solution of compounds which are suitable. All they do is to "grab" on to the H⁺ with one part and the OH⁻ with another. The resulting new compounds are complex, but oil-soluble and inert. As a matter of fact, to separate these materials and identify them is almost impossible. This is another indication of their inertness and similarity to the oil normally present in refrigerating systems.

THAWZONE

PATENTED

The PIONEER FLUID DEHYDRANT

HIGHSIDE CHEMICALS CO.
195 VERONA AVE., NEWARK 4, N. J.

ALSO MAKERS OF

TRACE
REFRIGERANT
LEAK INSPECTOR

A NEW HENRY SOLENOID VALVE Worthy of Its Name

for

"Freon" Methyl Chloride,
Water, Air, Oil, Gas, etc.



Simplicity of design and ruggedness in construction, characteristic of all Henry Products, are also found in this new, medium-priced Type SV-11 Solenoid Valve making it ideal for small capacity installations. Incorporated in a standard outlet box, it can be quickly mounted through screw holes provided and electrical connections can be easily made by utilizing one of three knock-outs in outlet box. Coil can be removed and replaced without disturbing electrical connections to thermostat or other electrical devices. Efficient magnetic circuit provides low current consumption and "floating plunger" insures quiet operation. Type SV-11 meets all requirements of the Underwriters Laboratory.

Furnished with $\frac{3}{8}$ " FPT connections in following standard voltages: 115 volt, 60 cycle and 230 volt, 60 cycle.

Optional Features for Volume Requirements

Type SV-11 Solenoid Valve can be mounted in approved metal enclosure, less outlet box. Lock nuts threaded on body for mounting. Also available with larger outlet boxes where multiple electrical terminals are required.

Henry Solenoid Valves include hard and soft seat types, with A C ratings 1 to 20 tons for "Freon." Also 10 tons and larger for Ammonia.

Sold by Leading Jobbers

HENRY VALVE COMPANY

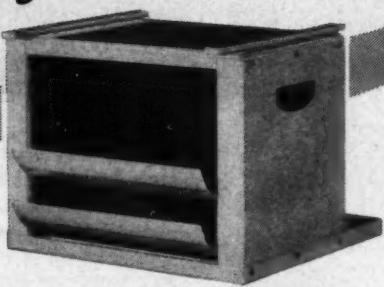
Control Devices, Valves, Driers, Strainers and Accessories for Refrigeration
and Air Conditioning and Industrial Applications

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- Built-in efficiency loop
- Patented liquid distributor
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- Slotted hangers for easy installations
- Complete range of capacities

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**to the solution of
your supply problem**

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Kelvinator
DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT

**CONDENSING UNITS
REFRIGERATION PARTS AND
SUPPLIES**

BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS



A COMPREHENSIVE LINE

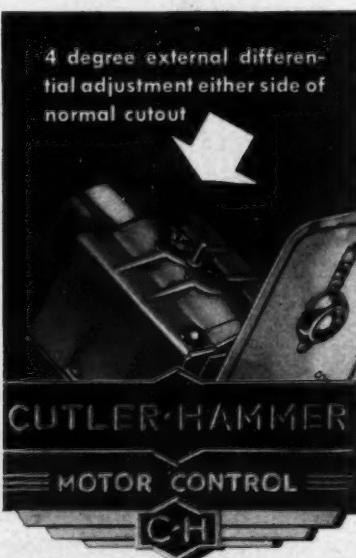
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The Cutler-Hammer line of Refrigeration Replacement Control is unusually comprehensive and complete. One unit alone, the *Universal* unit, will handle 60% of the repairman's needs. In rare cases where exact replacement control must be furnished, that item also will be found in the Cutler-Hammer line, individually packed, clearly labelled, complete with dial plate, mounting screws, trim washers and instructions for mounting, and range and differential adjustments.

The Cutler-Hammer Line of Refrigeration Replacement Controls is the product of more than 50 years of fundamental control specialization . . . another reason why outstanding refrigeration wholesalers recommend it and alert service organizations from coast to coast feature and use it . . .



CUTLER-HAMMER, Inc., 1363
St. Paul Ave., Milwaukee 1, Wis.



DOMESTIC, SEMI-COMMERCIAL AND COMMERCIAL CONTROL

**This One Universal
unit alone covers
60% of all needs.**

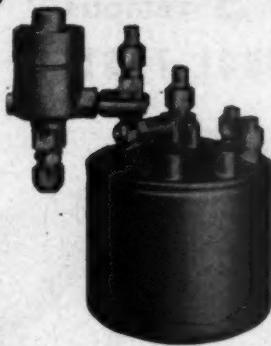
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Adjustable Mounting Brackets
Maximum Mounting Centers . . . 4-3/16
Minimum Mounting Centers . . . 2-3/16

Adjustable Cutout Feature—Differential can be increased 4 degrees by turning indicator in "Hi" direction and decreased 4 degrees by turning in "Lo" direction.

Adjustable Range—Turning screw clockwise lowers settings and counter-clockwise raises settings.

Operating knob can be adjusted to meet various evaporator scale settings. New knob is ideal for varying shield thicknesses. Makes this control adaptable to wider range of single dial replacement jobs where overload is not required in unit.



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WATER—There's a Temprite cooler to fit every type of drinking water application in office building, factory, school, etc., etc.



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18 VERSATILE TEMPRITE MODELS HANDLE WIDE RANGE OF APPLICATIONS

The famous Temprite liquid cooling units, long recognized for instantaneous, split-second cooling, are available to you in a wide range of no less than 18 models. Units are noted for their compact, easy to handle size, perfect temperature control and large capacity.

The cooling coils are directly submerged in the refrigerant itself which results in split-second cooling and high operating efficiency.

All Temprites are constructed entirely of non-corrosive materials. Can be applied to either new or existing applications. Write today for specifications.

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Originators of Instantaneous

80°  40°

Liquid Cooling Devices

45 PIQUETTE AVENUE

DETROIT 2, MICHIGAN

AIRSERCO'S famous THERMOSTATIC CONTROL TESTER



Detects thermostatic control defects without removing the control from its cabinet

Save blind tampering with thermo controls and eliminate guesswork with this time-and-labor saving device. The only instrument of its kind now approved as standard in the refrigeration service field.

AIRSERCO THERMOSTATIC CONTROL TESTER is now a 'must' for the shop and service man. It attaches by means of a quick connector to any small refrigerant service cylinder—uses for its operation Liquid Methyl Chloride, or Freon F-12. This handy chrome plated pocket-size instru-

ment services ALL makes of thermostatic controls. ★Quickly indicates cut-out and cut-in temperatures and detects ANY defect without removing the control from the cabinet. ★Comes complete with pocket case, bulb adaptor and temperature chart.
Model A100.....\$19.50

Now equipped with
replaceable Thermometer and cleavable Orifice Tube.
These parts carried
in stock at all times.

Write for descriptive folder
Representatives in Principal Cities



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SERVICE COMPANY

435 Melwood Street Pittsburgh 13, Pa.

If your service costs seem to be increasing out of all proportion



**ELIMINATE
THEM AT
THE START**

WHITE-RODGERS automatic controls cut service costs. This has been proved by manufacturers who have kept accurate records.

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OFFERS IMMEDIATE RELIEF TO REFRIGERATOR EQUIPMENT WITH LOW EFFICIENCY AND HIGH OPERATING COST. NU-COIL RESULTS ARE SURPRISINGLY LOW IN COST AND OFTEN THE SAVING IN ELECTRIC CURRENT ALONE PAYS FOR THE DESCALING OF COILS.

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VALVE PLATES
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YOUR WHOLESALER WILL SUPPLY NU-COIL
SKASOL CORPORATION

112 Glencoe Ave.

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November, 1946

18

THE REFRIGERATION

All's Quiet - TROUBLE IS GONE!

When You Use

PEERLESS EXPANSION VALVES

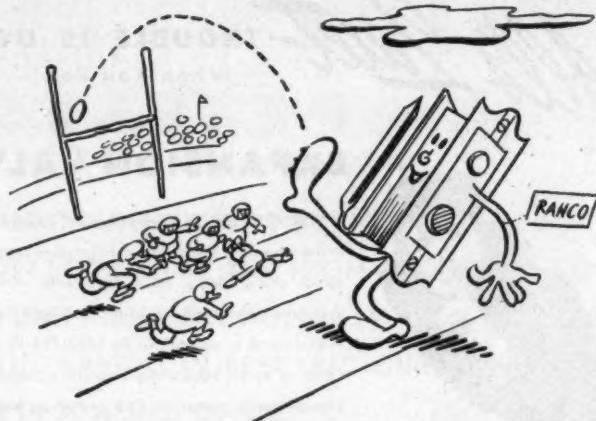
With PEERLESS VL "Velvet Action" Expansion Valves in the vital control spot of a refrigeration system, breakdowns due to jerky valve movements, with resultant over-feeding and under-feeding, are eliminated. Steady, even control is maintained by PEERLESS VL Valves because of sound basic design, careful manufacture, and highest grade materials—all proven in performance. The satisfaction obtained with PEERLESS Expansion Valves is duplicated in all other PEERLESS products. For performance, it's PEERLESS!

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Ranco Type O-1408 commercial temperature control for general applications.

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Uniform fixture temperature—

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Completely automatic coil defrosting—

Controlled air circulation—

Visual scales showing exact cut-in and cut-out points—

Yes, Ranco wins on points—that's why Ranco is the world's largest manufacturer of commercial and domestic refrigeration controls.

See Your Jobber

Ranco Inc.
COLUMBUS 1, OHIO

THE REFRIGERATION SERVICE ENGINEER

The
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of
Refrigeration
Sales, Service
and Installation

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ENGINEERS SOCIETY

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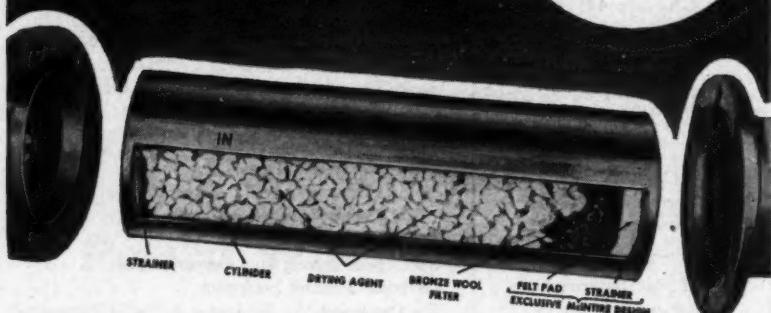
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Not Just One--

STOP ALL 3

FREEZE-UPS
CLOGGING
CORROSION



Not only does the DFN System stop those triple threats of trouble—moisture, sediment and acid—but it stops them in greater volume, thus, requires less recharging. Each cartridge is scientifically factory-packed to provide complete refrigerant dispersion and insure thorough contact with the drying agent. Hermetic sealing preserves 100% dehydrating effectiveness. An exclusive filter-strainer traps the finest particles and holds more without pressure drop.

And the DFN System is simpler and faster to service. The cartridge slips easily into the permanent shell—no fuss, no muss and no loss of dehydrating strength. This combination of complete protection, greater capacity and unequalled servicing ease makes the DFN System the outstanding value in its field. Ask your distributor or write today for Catalog R-7.

McINTIRE CONNECTOR COMPANY

253 JEFFERSON STREET

NEWARK 5, N. J.





IN THIS ISSUE

"ADAPTING the Summer Air Conditioner to Winter Use" by Edward Dowis, on page 25, is a timely article suggesting a profitable source of work for the winter months. There are many of these self-contained air conditioning units in stores, offices and other business establishments which remain idle from one summer season to the next. They can be made useful the year round with a few additions to them.

In his column "Getting Down to Business" on page 28 this month, Waylan Clarke suggests that the service operator pay more attention to the business in his own neighborhood if he has not already done so. He also makes some pointed suggestions on how to get this business.

Under "Questions and Answers" on page 30, one writer asks "What causes an iodine taste in ice cubes?" The editor of the section apparently does not know definitely but he makes a few suggestions.

The concluding article on "The Opportunity for Servicemen in Mobile Refrigeration" appears on page 33. It describes in detail three more types of equipment used in this work, which are available on the market.

One of the "Service Pointers" on page 37 suggests a way of winding a temporary solenoid coil without too much engineering calculations and how to make it work on the line current available.

"Preventive Maintenance for Locker Plants" by Paul Reed, appearing on page 56, provides some suggestion for the serviceman on what kind of contract is needed by these plants and what to inspect.

COVER

SERVEL, Incorporated, Evansville, Indiana, for the past two months have been moving into a big new building which will offer greater manufacturing facilities. With 240,000 sq. ft. of additional floor space, it is now possible to arrange machine tools and other processing equipment with the greatest possible efficiency. Flow of material from one operation to another now requires a minimum of delay in handling. Improved machinery developed for ultra-precision operations during the war have been installed in the Electric Division's new home. Many of the machine tools, the jigs and dies used on them have been delivered to Servel only within the last eighteen months. On days when materials are available, Servel's condensing unit plant runs full blast.

The view on the front cover is one of the final assembly lines in full operation.

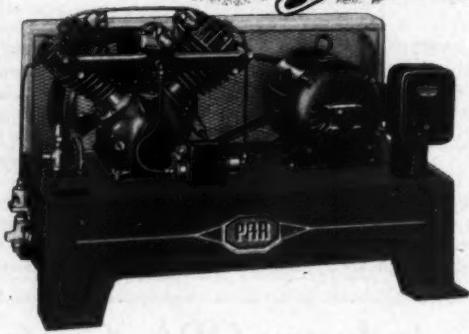
Industry O.P.A. Controls Eliminated

AS OF November 11, by a Presidential directive price controls on all refrigeration products and services are removed, according to an announcement by O.P.A. officials. The only items now remaining under controls are rents, rice and sugar—all other being freed.

According to industry leaders, the removal of price controls will result in an increased production in many items. At the same time they plead for a holding of the price line as nearly as possible to that of former O.P.A. prices. Increased production will mean a reduction in prices eventually. Excessive profit-taking now may cause a slump in buying which could do severe damage to our entire economic structure.



Often the things that count most are those you can't see, that's why it pays to compare. In PAR you find sturdy construction . . . economical dependable performance . . . plus many exclusive PAR features that give extra years of efficient, trouble-free service.



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Adapting The Summer Air Conditioner to Winter Use

By EDWARD DOWIS

THE refrigeration industry has pioneered in the development of year around air conditioning. It is the responsibility of the industry to keep the air conditioning plant or unit working at top efficiency in winter, as truly as it is in summer. The service engineer who maintains or installs summer air conditioning equipment is the only person properly qualified to modify, supervise and maintain that same equipment for its all year function. The person who has a nice investment in air conditioning equipment and still breathes dirty, dry, stale air in winter does not know what a qualified service engineer can accomplish. He has probably left his heating problem in the wrong hands.

A correctly installed air conditioner can perform a service which can be made indispensable in the proper conduct of a business or maximum comfort and health in the home. That should be the aim of the one who makes, sells, installs or maintains air conditioning equipment, whether it be a large central station system or a room conditioner.

The service engineer will do well to keep in mind that *air conditioning is the distribution of a controlled quantity of clean air at any required temperature, humidity or velocity.* All of these functions should be the responsibility of one man and that man, at least after the primary installation, is the service engineer. The purpose of this article is to outline the proper procedure in building heating and humidification into the summer conditioner, to make it a complete system, performing all the functions stated in the above definition, within the limits of its capacity.

Selecting the Equipment

The type of equipment needed will be determined by the heating medium. Steam and hot water are the most popular and are readily adapted to air conditioning. Electrical heating can be readily applied but is uneconomical for any but the smaller con-

ditioners, except where rates are quite low. Gas heat is readily applied to air conditioners by the use of highly efficient gas fired boilers, with steam or hot water coils in the air stream. The warm air furnace can be used with the conditioner by directing the warm air through the conditioner fan or duct system and suitable humidifying and control equipment.

Most self contained conditioning units are designed with provision for steam or hot water coils as optional equipment. The coil supplied by the manufacturer should be used, if available, as it is a very simple matter to install. Coils are manufactured in a variety of sizes so it should not be difficult to procure a coil which can be adapted to practically any conditioner. It should be rated to carry the required heating load at a steam pressure not over 5 pounds and air flow not exceeding that of the conditioner in which it is to be used. The usual position is immediately following the cooling coil, in the direction of air flow, and it should be installed so as to add as little resistance to air flow as possible. Any space, in the cabinet, which would permit air to flow around, instead of through the coil, should be closed with sheet metal. The humidifier, of whatever type, should follow the coil in direction of air flow.

The selection of a hot water coil is the same as for steam, except that it should be rated for water at about 180 degrees. The installation within the conditioner is the same as the steam coil.

The proper operation of a steam coil will depend on a few simple but important precautions:

1. The coil must be mounted so that the

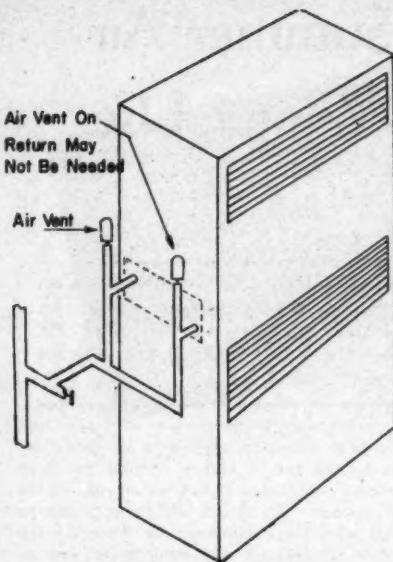


Fig. 1—Connection to one pipe riser.

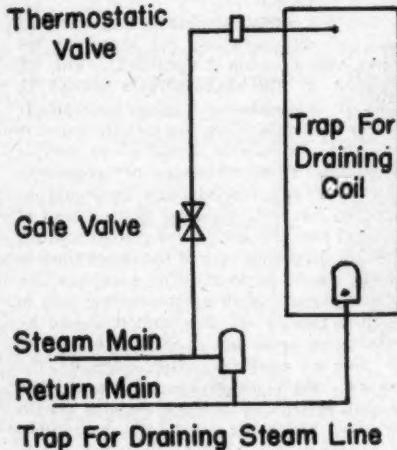


Fig. 2—Line diagram of two-pipe connection.

condensate will flow naturally to the drain connection.

2. Provision must be made to prevent air binding, as steam cannot enter the coil until air has been removed. In some systems, this is taken care of by a vacuum pump in the central heating system or an air vent may be necessary.

3. Water which condenses in the piping system must not interfere with the free passage of steam.

4. Steam must remain in the coil until it condenses and not blow through, while condensed water must be drained away.

The exact manner of connecting a coil to the steam supply will be determined by the type of steam distribution system used. In the one pipe system, steam is delivered to the heaters or radiators and the condensate carried away by the same riser. In the two pipe system a separate line is provided for the steam and condensate. Steam coils used for air conditioning have two openings, one for the steam supply and one for condensate return. They can, however, be readily connected to a one pipe system, provided the line is large enough to carry both steam and water.

Fig. 1 illustrates a simple method of connecting a small coil to a one pipe riser. For coils of larger size, or several coils in multiple it is advisable, and may be necessary to run a separate drain line to the boiler return, as conditioner coils are apt to condense at a very rapid rate, and the one pipe may be unable to return the condensate and supply steam at the same time. Fig. 2 shows the connections to a two pipe system with a steam trap in the return line, to permit passage of water, but prevent steam blowing through.

It should be remembered that steam and return pipes are subjected to rapid and wide temperature fluctuations and consequent expansion and contraction. It is not unusual for a steam outlet in a long riser to move an inch during the warm up period. This should be allowed for in piping, otherwise, fittings or equipment will be broken. This is usually prevented by arranging piping so that strains are taken by threaded fittings, making what is called a swing joint.

Whenever it is necessary to run steam lines vertically around beams or obstacles, the loops must be drained of water which would obstruct steam flow and induce steam hammer. Fig. 3 illustrates how such a loop may be drained. With a one pipe gravity return system the steam trap may be omitted and drain connected directly to boiler return line. Fig. 2 illustrates how the end of a steam main may be drained.

The most common causes of trouble in the steam heating part of a conditioner are undersized piping and entrapped water. The former will limit the output of the coil and the latter will cause steam hammer when

steam is first turned on after each off period. This can be eliminated by proper pitch to permit lines to drain away condensate which is continually forming, and drains at low points in piping.

Water Coils

If the conditioner is used in a building heated by hot water, a hot water coil should be procured and connected as directly as possible to the hot water system. If the system is not arranged to remove air, an air vent should be installed at the high point of the connections. Gate valves should be used as they offer minimum resistance to water flow. A minimum number of fittings should be used for the same reason. Rapid flow is important to get the full heat transfer and a circulating pump on the system will assist in this. Fig. 4 shows the connections for a hot water coil.

Humidification

Many air conditioning installations have been installed without provision for any humidity control. Cooling systems inherently remove moisture from high humidity air. The heating coil, however, cannot add moisture to the air. Air can contain moisture according to its temperature and the outside air, in winter, can contain only a limited amount of moisture. When it is heated its capacity for moisture is greatly increased and it tends to dry out everything with which it comes in contact, including respiratory passages. The adding of moisture is called humidification.

Humidification may be accomplished in any of several ways. Steam sprays, water sprays, wet filters or screens, pans of warm water or any of the mechanical humidifiers may be used either in the conditioner or the conditioned space. A humidifier, if used, should be controlled so as to maintain the right quantity of moisture. The control instrument, called a humidistat, will either open or close an electrical circuit or proportionately open or close valves or dampers, operate solenoid valves or other devices to maintain the relative humidity for which it is set. The usual method is to have the humidistat regulate the water or steam supply to the humidifier. The possible applications of humidifiers, controls, etc., to a conditioning system are almost limitless but, in general, the most simple installation which will give satisfactory results is best.

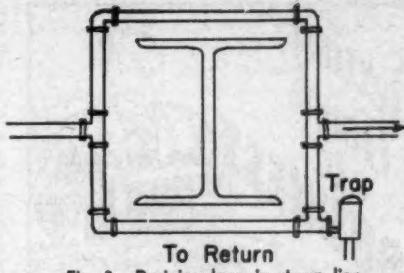


Fig. 3—Draining loop in steam line.

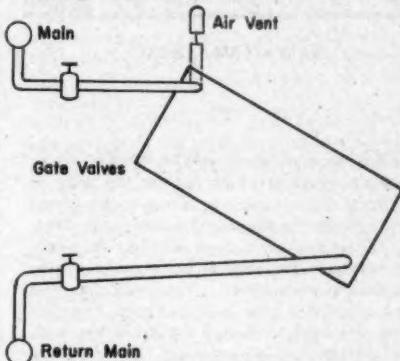


Fig. 4—Connections to inclined coil.

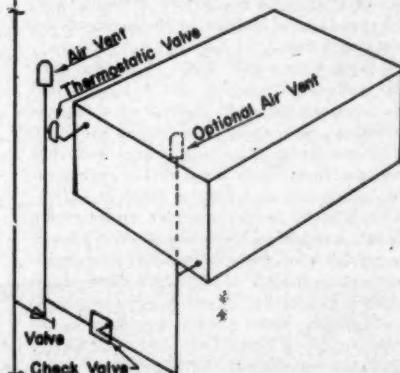


Fig. 5—Proportioning valve connection for one pipe system.

Next to the heating equipment itself, the temperature control is most important. In unit heater installations, temperature control is maintained by a thermostat which operates the fan when the temperature is below that required. This arrangement is

(Continued on page 78)



By WAYLAN CLARKE

IT'S a week night, or maybe Sunday afternoon. You are sent out by the wife to the drug store to pick up some cough syrup for Junior or toothpaste for the entire family. So, if you are a good deal like the average refrigeration service man, you perform the task perfumitorily. You walk into the drug store, tell your neighborhood druggist what you want, exchange a word or two with him about the government, the national sport, the latest neighborhood gossip, and then dutifully trot homeward, perhaps with only the slightest detour to the local winery for a quick one.

Nothing wrong with that. "You seen your duty and you done it." BUT if you had been a smart operator, instead of the average fellow, you might have looked around a bit in the drug store and discovered that there was most likely a variety of refrigeration equipment on hand—a reach-in refrigerator, a bottle beverage cooler, an ice cream cabinet, a soda fountain, maybe even a back-bar refrigerator, for any or all of this equipment can be found in a modern drug store.

And if you had still been smart, you could have casually asked your druggist some innocent question like, "Joe, how's all this refrigeration equipment working?"

To which Joe, the druggist, might likely have replied, "Oh, I guess it's working all right. I usually let the outfit I bought it from do the worrying about it. They come out occasionally or drop me a letter about it once in a while."

And Joe might even have followed up with "Why didja wanna know?"

Which would give you the cue to answer, "You see, I'm a refrigeration service man

myself, Joe, operating out of this neighborhood, and I'm kind of interested in the equipment you've got there."

And if you were still a smart operator, you might give Joe, the druggist, another shot in the arm, to this effect, "Y'know, the longer you run this equipment, the older it gets, and machines are a lot like people—the older they get, the more ailments they develop. Well, I could give your equipment a regular check-up from time to time just to see that everything's O.K. And if anything should go wrong anyway, why, being in the neighborhood, I can get here quick and fix it up for you."

By this time, you've planted a seed in Joe, the druggist's, mind, and he can eventually become a regular customer of yours, IF you are a smart operator, IF you work on Joe some more with personal calls, maybe a letter or two, as well.

The point is—it pays to keep your eyes open for business any and all times, and you needn't step out of your neighborhood to find it, if you look hard enough for it. And once having found it, go to work on the new business.

While we are on the subject of your neighborhood, let's check into the matter a bit more fully than Joe's drug store. Let's see what kinds of business—commercial business—you can dig up in your home territory.

Take the neighborhood bakery. They might be selling whipped cream cakes or other delicacies that call for refrigeration so they won't spoil. This means there may be a reach-refrigerator in the back for storing such items along with perishables like butter, milk, eggs. Maybe, too, they have display cases for the same purpose—possibly they sell potato salad or other perishable foods on the side, for a good many bakeries are caterers, too. At least, a bakery is worth a call in person, isn't it?

How about the local delicatessen? The same applies here.

How about bowling alleys? You will usually find water coolers or a water cooling system on hand. The same goes for billiard halls and the better pool rooms. Air-conditioning, too, if you can handle it.

More and more barber shops have portable water coolers. Here's something to keep in mind. And ice cream parlors—these are obvious sources of business for you.

What about the florist? He has to have a reach-in refrigerator if he expects to keep his business rolling. And it must be in tip-top working order at all times.

Let's not forget the funeral director, either. You'll find a water cooler on the scene, and special mortuary refrigeration equipment, if you go for that sort of a job.

The furrier has a walk-in refrigerator on hand—usually a big job to handle.

Take the gas stations in and around your neighborhood. There's probably a bottled beverage cooler on deck, not to mention the portable water cooler.

How about the neighborhood tavern? He has a beer cooling system, an ice cube maker, a bulk ice maker, a back-bar refrigerator, a reach-in refrigerator, a bottle beverage cooler. Yet, the average service man may see only the bottle in front of him when he stops in at his local tavern. (And sometimes, he may not be able even to see that.)

Restaurants, schools, clubs, nearby factories, office buildings, moving picture theaters, garages, churches, clinics, and all your stores—department, confectionery, clothing, meat markets, grocers, all of them represent potential service work for you.

Why, your neighborhood is alive with prospects—if you take the time to look around, inquire around, work up a convincing approach like the one you could have used on Joe, the druggist, if you hadn't been wearing blinders at the time.

"Who says the neighborhood is alive with prospects? Who says it's a big, wide-open field?" you argue. Why, when I talk to these store people, I find out in a lot of cases that the manufacturers and their representatives, with combined sales and service departments, have the whole deal sewed up."

Sorry, Mr. Easily Discouraged Service Man, your argument doesn't jell. Not if you look at it this way.

Granted some companies have sales and service branches working hand-in-glove in some communities, remember that this occurs usually in the larger communities and it's falling apart even in the bigger towns. Why? A good many manufacturers have found that they simply can't maintain their own service departments. It's too costly, too widespread. Consequently, these manufacturers are usually interested in hooking up with independents—yes, fellows like yourself.

And even if you don't choose to take on service franchises with the many manufacturers who might be interested in you, you still have two big points in your favor—two big selling points that you can turn to profitable use on these prospects we've been talking about.

First, *you are close to your territory*. You can get out in the neighborhood in a hurry—most likely a good deal faster than a manufacturer's service man. If the manufacturer actually has one within reach of your town. And secondly, you are, or should be, ready to tackle a wide range of equipment—something that most likely cannot be said for the exclusive, manufacturer-tied-up service man who knows best only one make of equipment.

In other words, you are an *independent* service man, experienced or trained in all makes and models. You are the fellow who can get to work on Joe, the druggist's, various units with equal ease and understanding.

The business is there for you, Mr. Independent Service Man, and you can sell your service on the basis we've just discussed. Then maybe, as you develop, you can take on a manufacturer, take on sales, move into

(Continued on page 78)



Don't be blind to your neighborhood business.



QUESTIONS and ANSWERS

On Problems of Servicing and Installation of Refrigerating Equipment—Send Your Problems to the Question Box.

FREEZER OPERATION

QUESTION 769: Will you kindly let me know if a freezer operates in a satisfactory manner while installed in the basement? Some refrigerator servicemen claim that they do not. I would like your opinion in this matter.

ANSWER: I am not quite sure what you mean when you ask if a deep freezer will operate satisfactorily in the basement. If you mean that the entire unit, cabinet and compressor are installed in the basement I would say there is no reason why they should not operate better, if anything, in the basement than on the first floor. Basements are usually much cooler than kitchens or other first floor rooms and the freezer should have a better opportunity of maintaining desired temperatures.

If you mean that the unit would be installed in the basement, while cabinet is on the first floor, satisfactory operation would depend largely on the type of liquid control used in the system. With a high side float it is a little difficult to obtain good operation in such an installation because of the temperature difference between the first floor and basement. If it is installed in the basement it is necessary to insulate the liquid line leading up to the cabinet and if the high side float was left in the cabinet on the first floor, you would probably have difficulty in air or gas binding the float, which would interrupt operation when the temperature difference became too great between basement and first floor.

Any other type of liquid metering device would cause no trouble if the unit were installed in the basement.

CRACKING NOISE IN NORGE

QUESTION 770: What causes a Norge household refrigerator to give out a sharp cracking sound when the unit first starts up?

ANSWER: The sharp cracking noise in the Norge household refrigerator is probably due to a leaky check valve located in the suction shutoff valve in the compressor. When these check valves leak it permits the

leakage of refrigerant back to the low side during the idle period and because the high pressure side of the compressor is flooded with oil this leakage of gas carries oil back through the compressor to the suction side with the vapor refrigerant.

When the compressor starts on the on cycle it will pump oil for the first few seconds, causing a cracking noise. It will be necessary to replace the check valve.

The other possibility of trouble is that there is too much oil in the system which is returning in rather large quantities from the low side. The effect, of course, would be the same.

IODINE ODOR IN CUBES

QUESTION 771: I had a service call on a Coranado refrigerator that the ice cubes taste like iodine. It works good in every respect except for that. The rest of the food in the box has no bad taste. I tasted butter that had been in it for two months and it was O.K. The ice trays and box have been boiled in soda water but that did not help. This is a sealed unit using 9 oz. of "F-12." This should not cause any off flavor or if it did it would soon be short of gas and lose its refrigeration. It can't be in the insulation or it would taint all the food in the box.

ANSWER: I am at a loss to account for the taste of iodine from the ice cubes in the Coranado refrigerator. As you say, if it came from the box or insulation, or any such sources, the butter or milk would be one of the first items to take up the taste.

It might possibly be caused by flaking from the evaporator. In other words, the coating or rust-proofing on the evaporator may be flaking off and falling into the ice cubes which would give it the taste. Rust from hanger bolts and hanger may be another possibility—or the ice trays themselves may cause it. Where rubber inserts are used in ice cube trays the rubber will often take on an odor and impart the taste to the cubes, particularly after a year or more of use.

I don't think that the taste can be coming from a leakage of refrigerant or from any

of the usual things that cause odors in refrigerators. Such odors usually come from sealing compounds or wood preservatives such as creosote.

BEAL FREEZER VALVE FREEZES

QUESTION 772: We have been having trouble with one of the new Beal deep freeze boxes. It will refrigerate normally for several hours, then the expansion valve closes tight, the low side goes into a deep vacuum, and all three of the cold plates defrost and warm up, but the valve remains cold, and if the unit is allowed to continue running the valve never opens normally again but seems to just let enough refrigerant through to keep the valve cold. If the unit is shut off for a while, then started, it will operate normally for a few hours then repeat.

We were convinced that the trouble was moisture, and put in a new calcium chloride dehydrator every day for a week, then finally put in some alcohol, but nothing seems to do any good. The cold plates are placed one above the others, serving as shelves. They are in series, with the valve at the top and the bulb at the bottom. One refrigeration man suggested that we may have the valve located wrong, or that the bulb might be in too cold a place. The valve can be opened up by heating it, and opens with a cracking noise just as though it were frozen shut.

ANSWER: I am of the opinion that your trouble with your Beal deep freeze unit is wax formation in the expansion valve. The wax, of course, comes from oil which is not suitable for such low temperature work. The wax is separating out at the coldest point of the system—the expansion valve orifice. The effect would be much like moisture except that driers would do no good.

The best remedy is to pump the system down in an effort to get all the oil back to the compressor, then replace the oil with the best grade wax-free oil obtainable. It would be a good idea, at the same time, to wash the valve out although the removal of wax from it can be done by heating the valve and permitting the wax to circulate back to the compressor with the oil.

It would also be necessary to warm up the entire evaporator so that any oil held in it may be returned to the compressor.

HIGH HEAD PRESSURE

QUESTION 773: I have run up against something that has me stumped and I need some advice as quickly as you can get it to me. First I will give you the setup of the machine and then, how it is acting.

It is a Mills unit, model MALAM and a $\frac{1}{4}$ hp. motor. It is on a reach-in cooler about $\frac{1}{2}$ ft. deep, 8 ft. wide and $5\frac{1}{2}$ ft. high. It has a Detroit T.E.V., .9 capacity valve and a Ranco pressure control. The control is set to cut in at 35 lbs. and out at 12 lbs. It has CH₃ cl refrigerant in it. The unit is in a large room with temperature at 80° to 90°.

The unit runs continuously and the coils just get cool. The T.E.V. will hiss by spurts. The head pressure when unit was idle was 90 lbs. but after it has run for a few minutes it goes to 150 lbs. When I shut the motor off the head pressure fell back to 90 lbs. The discharge line, condenser, liquid receiver and liquid line were hot. I could hold on to them but that was all. The T.E.V. was warm. The back pressure didn't seem to want to come below 30 lbs. in the two hours I was checking the unit. The motor ran hot and had a very hard time pulling the compressor and if I shut the motor off and turned it back on, it would slip the belt. I checked the compressor for efficiency and it would pull about 18 inches of vacuum at the best, and then not very fast. With both service valves frontseated the compressor would not go below 15 inches of vacuum and when the unit was shut off the 150 lb. head pressure would fall to 130 lbs. and the 15 inch would go to 5 inch back pressure. The control worked OK.

I can't figure this out. If it were short of refrigerant the machine would short cycle and if there is air in the system, why does the head pressure fall back?

I surely hope you can help me out of this in the next few days as it is in a restaurant and the owner needs it badly.

ANSWER: There are several possibilities in connection with your trouble on the Mills unit apart from the immediate symptoms you have stated. First of all, the size box you have described seems to be a pretty big load for a $\frac{1}{4}$ horsepower motor, although if the cabinet is well insulated it will probably handle it satisfactorily providing the machine is up to full efficiency.

Second—There is the possibility that the compressor is not up to full efficiency since you state that the best vacuum you can obtain on it is 18". I am not sure whether this test of the compressor was made against the high head pressure of 150 lbs. or whether the discharge of the compressor was open to the atmosphere while testing.

It is possible that the valves in the compressor need replacing. It is my opinion that your present trouble is due to air in the system and a shortage of refrigerant. The

hissing noise by spurts in the expansion valve indicates a shortage of refrigerant. The hissing will occur each time the liquid seal is broken in the liquid line and vapor or air passes through the valve. A head pressure of 150 lbs. indicates that some non-condensable gas or air must be in the system. The machine would not short cycle because this head pressure air and gas is by-passing through the expansion valve at a high enough rate to keep the suction pressure from reducing to the cut-out setting of the control. A leak in the receiver valve inside the receiver which would admit high pressure vapor to the liquid line, would be another possible cause of the trouble.

The head pressure falls back to 90 lbs. after the machine is shut off because all the vapor refrigerant will condense to liquid.

ICE CREAM CABINET RUNS CONTINUOUSLY

QUESTION 774: I am having trouble with an ice cream cabinet. This cabinet is a dry expansion submersion type coil, operated by an expansion valve. It was installed by another party. The brine in the cabinet is alcohol now and was a calcium chloride brine before.

The trouble is that this machine will not shut off. Switch is set for 10 lbs. in and 1 lb. out for methyl chloride. Expansion valve bulb is clamped on to the suction line just coming out of evaporator. We get a frost back part way down the suction line. Machine will almost reach a cut-off but can't seem to get there. Is it possible that the bulb being clamped to suction and not in the refrigerated area is causing the trouble? Does the bulb have to be submerged in the brine? This is an old Copeland machine, but the box I do not know the name of. The compressor checks out OK and is fully charged.

Is it possible to use a high side float duplexed with another cabinet operated by an expansion valve?

ANSWER: I believe your main trouble with the ice cream cabinet is that the thermostatic bulb of the expansion valve is located in the wrong place. It is necessary to have the bulb submerged in the brine and located near the bottom of the coil.

I would not suggest trying to use a high side float on one cabinet and an expansion valve on the other, since the two will not operate together on one machine.

There is one other possibility of trouble in this system and that is that the alcohol solution is too weak. A weak solution would permit freezing of water next to the evaporating coil which, in turn, would set up an insulating blanket of ice around the coil and retard refrigeration. An indication of this would be a rather low suction pressure for the temperature maintained in the cabinet.

I think, perhaps, your main trouble is in the location of the expansion valve bulb as mentioned previously.

KELVINATOR STANDARD EQUIPMENT

QUESTION 775: I have repaired several old Kelvinator boxes (around 1934 boxes), and about 6 cu. ft. The condensing unit was on the bottom. Now on several of these boxes they had a high side float mounted on the condensing plate where the compressor and electric motor is mounted, and then there have a valve mounted by the porcelain evaporator. Here lately I have been working on some that have an automatic expansion valve mounted by the evaporator, and then there is a receiver mounted on the condensing plate by the compressor and motor.

Can you tell me which one of these is correct? In case neither one of these are, please tell me what Kelvinator had on these boxes.

Another question—is the Kelvinator standard evaporator designed for an automatic expansion valve in this box?

ANSWER: Kelvinator units in the past have employed both expansion valves and high side floats. According to our records, those manufactured during 1931 and some made in 1932 employed an expansion valve. The PK and K models in 1932 employed a low side float. Both of these, of course, would also have to include a receiver on the condensing unit.

From 1933 to 1937, inclusive, all units were equipped with high side floats and there would be no separate receiver where this metering device is employed. The float was an upright type having the appearance of a vertical receiver and, in fact, acted as both.

A little valve up near the evaporator is a loaded type pressure differential valve which serves the purpose of preventing frosting of the liquid line between it and the outlet of the high side float. The valve is so loaded as to create a pressure difference of about 25 lbs. across it. In other words,

(Continued on page 78)

The Opportunity for Servicemen in Mobile Refrigeration

Continued from the October Issue

Thermo King

THE U. S. Thermo Control Co. of Minneapolis, Minn., started the development of a self contained trailer and truck unit in 1937. During the war they designed a unit for the Army Quartermaster Corps for use in refrigerating 10 ton aluminum trailers. With some refinements the unit is now available to the civilian market. It is known as Thermo King.

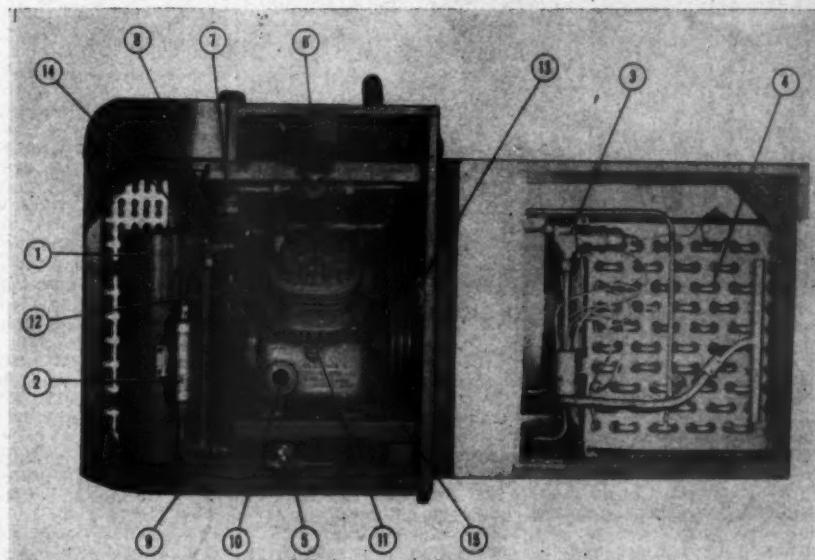
It is a self-contained unit, complete in a single frame designed to withstand the stress of over-the-road operation. Single package construction eliminates long refrigerant lines which are subject to breakage. The unit is composed of two main sections separated by an insulated bulkhead which prevents engine heat from entering the cooling coil section. In the front section which remains outside the truck body are the engine, compressor,

condenser, controls and instruments. The rear section which is inserted into the truck or trailer body contains the evaporator coil and blower.

To install the unit, it is necessary only to prepare an opening of approximately 24 inches square in the top front of the body. Vertical wood members may be fastened to the body on each side of the opening if additional support is required. The unit is then inserted into the opening as far as the bulkhead and fastened to the body with four bolts. If the refrigerator is not to be used for part of the year, it can be removed in a matter of minutes and the opening covered.

It weighs 750 pounds, a result of a generous use of aluminum.

Operation of the system is entirely automatic. At the start of the trip, the operator adjusts the thermostat to the tempera-



The Thermo King unit which is a self-contained, fully automatic refrigerating system, installed in the nose of a trailer.



One of a recently inaugurated fleet of refrigerated trailers equipped with hold-over plates and electric plug-in units.



Interior of Franklin trailer showing location of hold-over plates.

ture to be maintained in the truck. When the starter switch is snapped on, the combination starter-generator begins to crank the engine; an automatic unloader valve relieves the head pressure in the system to ease the starting load; an automatic choke is put into operation. When the engine has reached operating speed the unloader valve closes, the automatic choke is de-energized and the generator cuts in to charge the unit's battery. The unit will operate until the desired temperature has been reached, whereupon

the unit will automatically stop. When the temperature in the body rises a few degrees, operation will again start automatically. Regardless of outside temperatures the unit will maintain the temperature set on the thermostat.

The combination starter-generator is a Thermo King patented system mounted directly on the engine crankshaft, eliminating separate starter and generator motors, bendix drive, gears and belts. Should the engine fail to start within 60 seconds, a circuit-breaker stops the cranking. Another feature of the unit is its "hot gas" method of defrosting the evaporator coil. By the snapping of a switch, the hot refrigerant gas in the system is sent through the evaporator coil instead of the condenser, and the frost quickly melts from the coil and drains off outside the body. The frequency of defrosting is governed by the outside temperature, frequency of door-openings, humidity in the air and the nature of the cargo.

Power for the Thermo King unit is supplied by a two-cylinder gasoline engine, belt-connected to the compressor and blowers. The compressor is a standard, large capacity, four-cylinder unit, and the blower a sirocco type. Refrigeration of the cargo is accomplished by the circulation of air from the body through the evaporator coil where the heat is extracted and back into the body across the top of the load.

Year 'Round Conditioning

Many carriers of perishables require a unit that will perform year 'round, providing heat as well as refrigeration. To answer this requirement Thermo King has developed a heating accessory which can be installed on the machine. Temperature is controlled by a thermostat in the same manner as the refrigeration is controlled.

Most manufacturers of refrigerating equipment for trucks recommend a minimum of 2" of good insulation for truck body temperatures of 32° to 35° and a minimum of 4" of insulation for temperatures of 0° to 15°.

While the interstate transport seems to lean toward the packaged type equipment such as Thermo King and Trail-Aire, there are many interstate trucks, local delivery and short haul trucks and trailers equipped with hold over plates and either a gasoline engine driven compressor or a power take off from the truck drive shaft. Local delivery trucks are also equipped with hold over plates designed to be refrigerated at night only while the truck is in the garage.

As trucks and truck bodies become available, there will be an ever-increas-

ing number equipped with refrigeration and more and more business for the service company with the "know-how" to handle the installation and service.

Several of the refrigerating compressor manufacturers make gasoline engine powered condensing units and the Waukesha Motor Co. have produced quite a number of pull out type of unit for trucks and motor coaches. Kold-Hold Manufacturing Co. of Lansing, Mich., and Dole Refrigerating Co. of Chicago are two of the firms making hold-over plates for trucks.

Hold-Over Plate System

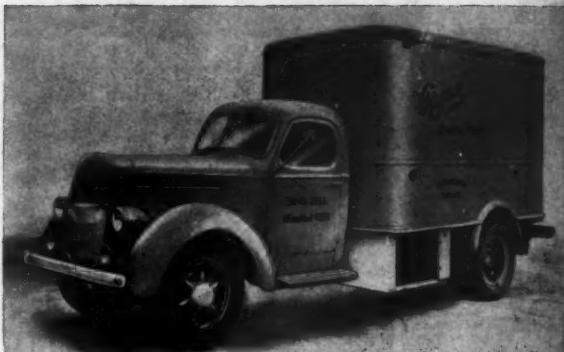
The Franklin Ice Cream Company of Kansas City, Mo., recently inaugurated a new fleet of eight semi-trailer delivery trucks using Kold-Hold hold-over plates. Each of the new trucks is equipped with seven plates to handle an ice cream load of 1800 gallons capacity, maintaining a maximum operating refrigeration temperature of -18° F.

Electric plug-in compressor units are mounted in the truck body. These units can be used, wherever electricity is available, for building up "hold-over" refrigeration. They enable the truck driver to plug into any convenient electric outlet for overnight cooling. This feature also allows the goods that have been carried over from the daytime run to be left in the truck overnight, thus eliminating extra time spent in unloading and reloading.

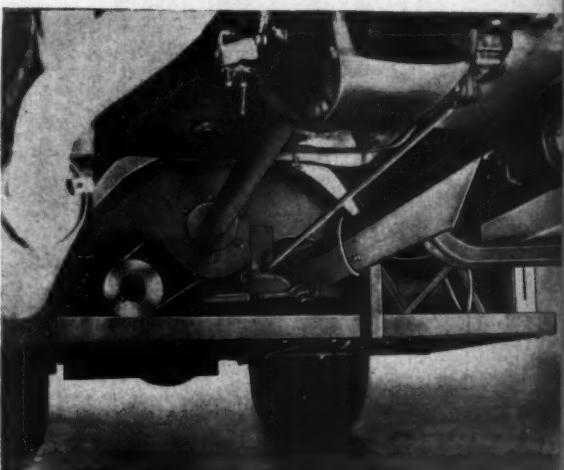
The hold-over plates maintain controlled refrigeration equal to that afforded by regular holding rooms; at the same time "building up" hold-over refrigeration that enables the making of full daytime hauls without using the compressor unit.

Plate Arrangement

The truck bodies, made by the Herman Body Company of St. Louis, are divided into three compartments—two end compartments and a drop center compartment. Two of the hold-over plates serve as partitions with two more at either end of the truck and three located in the roof. This arrangement gives each compartment the cooling benefit of two side plates and a top plate.



View of the Ryan refrigerated truck showing the housing for the compressor, motor and condenser.



View under Ryan truck showing V-belt power take-off, compressor drive shaft, compressor and condenser on right.

Power Take-Off From Truck

Eleven years ago, William Ryan, Jr., president of Ryan Quality Meats, St. Louis, and his associate, Alfred C. Ratermann, designed and built an efficient compressor unit that could be driven from the propeller shaft of a meat truck during the regular daily run; or operated overnight for hold-over with an electric motor (110 or 220) plug-in connection in the garage. The unit was to have no more fuss or bother on the change-over than merely shutting off the truck motor and plugging in, the same procedure to be reversed in the morning.

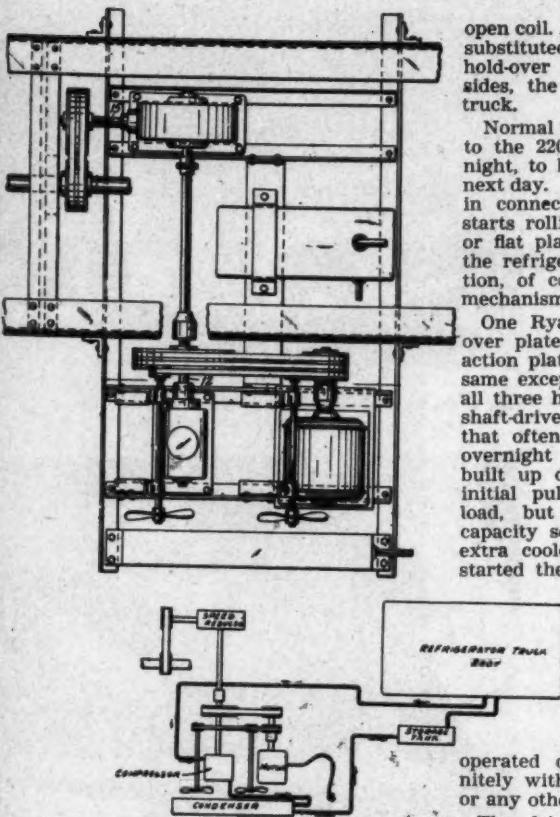


Diagram of the refrigerating system and drawing of equipment beneath the truck.

These units were operated successfully for eight years with minor repairs and only the minimum maintenance required of any compressor unit. Then, with the practicability of the units thus demonstrated after a few years' use under all conditions, patents were applied for and issued.

One unit consists essentially of a compressor, a motor, and the power take-off mechanism. It may be installed on most refrigerated truck bodies within a few hours time by any good mechanic. Then, any good refrigeration service man can complete the connections to the truck's lowside equipment through the liquid and suction lines, and the truck is ready for service.

Most Ryan meat trucks employ two hold-over truck plates of the proper size and capacity for the truck, and one small

open coil. A quick-action flat plate may be substituted for the coil if desired. The hold-over plates are arranged on the sides, the coil across the front of the truck.

Normal procedure is to plug the unit in to the 220-volt circuit at the garage at night, to build up the hold-over for the next day. In the morning, when the plug-in connection is pulled and the truck starts rolling for the day, the open coil or flat plate takes over and replenishes the refrigeration as it is used. This action, of course, is from the drive-shaft mechanism.

One Ryan truck employs three hold-over plates, and no open coil or quick-action plate. Here, the procedure is the same except that on the next day's run, all three hold-over plates operate off the shaft-driven compressor. Mr. Ryan says that often with this truck, plugging in overnight is not necessary. Hold-over built up during the day after the one initial pull-down, not only carries the load, but provides enough additional capacity so that truck can be used for extra cooler-room space overnight, and started the next day merely by driving out of the garage (without having used the electric motor plug-in). Though there has been no specific occasion here to use this particular truck for cross-country or unusually long hauls, the logical conclusion is that the truck could be operated on the power take-off indefinitely without returning to the original or any other plug-in source.

The drive-shaft mechanism is pre set FAST for use on city delivery, SLOW on country or long-haul delivery. However, the setting may be changed manually from one to the other at any time routing schedules for any one truck are changed.

The Ryan trucks are well-insulated. While the insulation is largely the problem of the body-builder, Mr. Ryan's experience with his own trucks indicates that a minimum of four inches of Dry Zero, or its equivalent, should be used in any event.

Also, it is interesting to note "that the compressor and the fans may be operated independently, either by the vehicle or the electric motor, without changing the mechanical driving connections. This is permitted by the unidirectional clutches. In other words, when the compressor is being driven by the propeller shaft of the vehicle, the clutch will permit the

(Continued on page 78)



A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

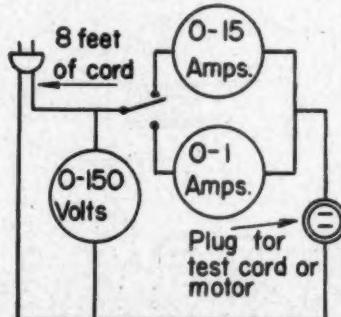
STRAINER FOR SO₂ SYSTEM

ON OLD sulphur systems and systems changed over from sulphur where there is a large amount of sulphurous corrosion present, the installation of a sack type strainer in the liquid line in an upside down position as illustrated, will prove very satisfactory. The inverted mounting increases the capacity and consequent efficiency of the device.—Submitted by John W. Sterling, Detroit, Mich.



HOMEMADE VOLT-AMMETER

I HAVE a volt-ammeter which I have been using for quite a number of years. It has a homemade box. One ammeter has 0 to 15



range for large motors and the other one has 0 to 1 amperes for small fan motors and coils. The voltmeter is 0 to 150 volts. I use a single-pole double-throw switch for the switching arrangement.

I have a calibrated chart which shows the capacity of motor starting condensers. By measuring a group of condensers I have been able to draw a list showing the amperes for the capacity. It sure saves times and reduces service calls. The wiring diagram is included. The meters are Jewell meters and cost \$7.50 each, which were purchased before the war.

According to the formula:

Amperes

$$\text{Capacity} = \frac{\text{volts}}{\text{volts}} \times 2650 \text{ for } 60 \text{ cycle}$$

work. I have drawn up the following chart:

Amperes	Volts	Capacity
15	115	846
14	115	824
13	115	900
12	115	277
11	115	254
10	115	230
9	115	208
8	115	184
7	115	162
6	115	138
5	115	115
4	115	92
3	115	69
2	115	46
1	115	23
0.5	115	11.5

—Submitted by Julian M. Gantt, Montgomery, Ala.

TEMPORARY SOLENOID VALVE

SOLENOID valves have coils of several hundred turns of very small wire, and are very difficult to rewind in the ordinary shop. It is a slow, tedious job even if a lathe and the right size wire happen to be available.

A quick way to keep the system in service is to cut the old wire off the old form or spool. If it isn't burned too badly it can be taped and rewound, and if so a spool can be made from the old junk box. Wind all the wire possible in the available space, of most

any size enamel or cotton covered No. 18 to No. 28 wire. This will make a lower voltage coil requiring from 1 to $\frac{1}{2}$ ampere to operate the valve. Operation is accomplished by connecting an ordinary lamp bulb in series with the coil. The size lamp necessary will depend on the number of turns you get on the coil. Use a lamp just large enough to operate the valve. On most any coil the lamp will be small enough to limit the current below the current carrying capacity of the wire used. This method can be used on most any magnetic coil with a little ingenuity, and keep the plant in service until proper parts can be obtained.

An actual example is a burned out coil on a $\frac{1}{4}$ " brine line solenoid valve. 110 volt, 60 cycle, 24 watt coil. Rewound on old taped up coil form all the wire (No. 28 enamel) possible to get in available space, using an ordinary 60 watt, 120 volt lamp in series. This has been in operation over a month on a large walk-in cooler, waiting the arrival of a new coil. In some cases these coils are 220 to 250 volt. When operating on this higher voltage, 220 to 250 volt lamps of higher wattage (around 100 watts) could be used to obtain enough voltage drop across the coil and enough current, or two more readily available 60 watt, 120 volt lamps in series would be O.K.—Submitted by Glenn Fee, Knoxville, Iowa.

ALCOHOL IN EXPANSION VALVE

MAY I offer this pointer in connection with the item Operation of Thermo-static Expansion Valves.

When castor oil has not been put into the rubber cap, or the cap has been left off entirely, moisture will get into the bellows. My quick remedy is to use the rubber cap and pour in a tablespoon of whisky or alcohol which will soon be sucked into the bellows, too, thus rendering the water harmless. Later add castor oil and your troubles are over. Cost about 2c.—Submitted by Ed. F. Smith, Chicago, Ill.

RANCO FOR WESTINGHOUSE

SOME time ago I was called out on a Westinghouse refrigerator on which I discovered that the bellows had lost its charge and at that time I was unable to get the control repaired. I took a Ranco cold control and hooked the two wires from the Ranco to the two terminal control points "A" and "D" on the Westinghouse and clamped the bulb from the Ranco on the inside of the box and it works fine. All that has to be done to the Westinghouse control is adjust the grasshopper screw high so it will not make contact on "A" and "D," and the Ranco will take care of the rest.—Submitted by John Legrady, Chicago, Ill.



"—Needs Oiling don't she?"

RSES 9th Convention "Tops"

Record Attendance Strains Facilities

THE ninth annual and first postwar convention of the Refrigeration Service Engineers Society, held in Cleveland Oct. 28 to 29, at the Hollenden Hotel, exceeded all expectations in attendance and proved to be the most informative and enjoyable convention in the history of the Society. Even the weather man cooperated by supplying clear, sunny weather, with temperatures in the 80's throughout the entire session.

More than 1,000 registered at the RSES registration desk and attended the various features of the four-day session. Hotel facilities were crowded to the bursting point and it was only the highly efficient work of the convention housing committee from the Cleveland Chapter which prevented many from being left without suitable accommodations.

During the four crowded days of meetings and entertainment features, the delegates and visitors witnessed an outstanding parade of speakers on a highly informative variety of subjects; three social gatherings, one of which featured the Governor of the state of Ohio and Congresswoman Frances P. Bolton as speakers; two business sessions during which, among other things, a new slate of international officers were elected and a much expanded educational program was discussed and planned.

Saturday, October 26th

A Board of Directors' meeting was held on Friday, October 25, just prior to the opening of the convention. Some early arrivals registered Friday evening. Officially, the convention opened Saturday at 9:30 A.M., October 26, and registrations were extremely heavy during all of that day and most of the next day. The convention was called to order by Paul Spring, President of the Cleveland Chapter and General Convention Chairman, at 2:00 P.M. The introduction of international officers and of convention committee chairmen was the first order of business. President Clarence Buschkopf then addressed the meeting.

A report of the Treasurer, C. J. Doyle, Omaha, Nebr., showed a very healthy growth in the financial status of the Society and was well received by the delegates.

International Secretary H. T. McDermott's report outlined a summary of activities for the year and made further recommendations for expanded activities for the future. His complete report will be included in a bulletin to the membership at a future date.

Convention committees appointed by the President included: Nominating Committee, E. A. Plesscott, St. Louis, Mo., Chairman; Wm. Sneath, Toronto, Ont.; V. E. Denny, Pasadena, Calif.; J. Manley, Montgomery, Ala.; Wm. E. Tierney, Worcester, Mass.; Carl Dieter, Youngstown, Ohio; and John Sackey, Gales-

RSES 1946-7 INTERNATIONAL OFFICERS

W. W. Allison, Los Angeles, Cal., President.

Wm. Marshall, Toronto, Can., 1st Vice-Pres.

C. C. E. Harris, Cambridge, Mass., 2nd Vice-Pres.

H. T. McDermott, Chicago, Ill., Secretary. C. F. Doyle, Omaha, Nebr., Treasurer.

J. L. Driskell, Burley, Idaho, *Sgt.-at-arms*.

Directors

Walter E. Booth, Richmond, Va.; T. L. Burrough, Houston, Tex.; Nap. Brosoit, Quebec, Canada; A. L. Robertson, Madison, Wis.; C. S. Tucker, Birmingham, Ala.; Olin C. Yates, Seattle, Wash.; Earl Yockey, Columbus, Ohio.

P. B. Reed, *International Educational Director.*

burg, Ill. Auditing Committee: Gordon A. Burns, Toronto, Ont., Chairman; Ralph Davis, Buffalo, N.Y.; and Dwight W. Coffman, Temple City, Calif. Resolutions Committee: A. L. Robertson, Madison, Wis., Chairman; J. Pat Riley, Long Beach, Calif.; Harold Lambert, Springfield, Mass.; Dean Holmes, Minneapolis, Minn.; and W. Hall Moss, Memphis, Tenn. Credentials Committee: Claude A. Brunton, Huntington, W. Va., Chairman; J. Cecil Sharp, Logan, Utah; and R. C. McCarthy, Rockford, Ill.

The first session adjourned at 4:30 P.M.

Saturday Evening

Saturday evening was occupied by the first social gathering of the convention. It was a buffet supper and entertainment, held in the Grand Ballroom. Due to the large crowd in attendance, the buffet took more time than expected and was a little confusing. However, everyone seemed to have an enjoyable time and the entertainment that followed was exceptionally good. About eight first class acts provided an interesting show until nearly midnight.

Sunday Morning

The Sunday morning session led off with an "Information Please" period, conducted by Paul Reed, Educational and Examining Board. As usual this session proved lively and interesting. Questions came quite fast from the floor and were ably answered by the Board of Experts assisting Paul Reed.



W. W. ALLISON, Los Angeles
President



C. C. E. HARRIS, Cambridge
2nd Vice President



W. J. MARSHALL
Leaside, Ont.
1st Vice President



H. T. McDERMOTT, Chicago
Secretary



C. J. DOYLE, Omaha
Treasurer



J. L. DRISKELL, Burley, Idaho
Sgt.-at-Arms



PAUL B. REED
Chairman International
Educational Committee

pected in the exhibition next two days and invited everyone to attend.

Ted I. Glou, President of the Refrigeration Equipment Wholesalers Association, offered

H. F. Spoehrer, President of REMA, was the first speaker of the morning. He offered greetings from the Refrigeration Equipment Manufacturers Association. Mr. Spoehrer traced some of the history of cooperation between RSES and REMA and lauded the work and growth of the Society in their particular field. He told them something of what was to be expected in the exhibition next two days and invited everyone to attend.

greetings from his group and congratulated the association on the exceptionally fine attendance.

Warren W. Farr, President of the National Association of Refrigeration Contractors, spoke of the plans of his group during the next few days, extending a welcome to any of the RSES membership to visit them at their permanent headquarters located in Cleveland.

The first educational speaker on the program was H. F. Hildreth, Manager of the Refrigeration Specialties Dept. of Westinghouse Electric Corp., Springfield, Mass., who spoke on the subject of "The Service Engineers' Place in the Refrigeration Industry." Mr. Hildreth traced the growth of the industry and the growth of the service field along with it. He gave high tribute to the work done by the service groups during the war, in maintaining refrigeration in the face of such difficulties and odds. He outlined possibilities of the future and suggested the part the service engineer would play in that future.

Dr. Donald K. Tressler, co-author of the book "The Freezing Preservation of Foods"



H. F. HILDRETH

DR. D. K. TRESSLER

FRANCES P. BOLTON

R. W. AYRES

Speakers on the Program of the RSES Convention.

by Tressler and Evers, was the last speaker of the Sunday morning session. His talk followed much along the general line of his book, dealing entirely with the subject of things we need to know about foods. It was a very interesting subject—quite technical, but simply explained by Dr. Tressler.

Sunday Afternoon

At 12:30 P.M. Sunday afternoon, a luncheon was held in the Assembly Room which was attended by a capacity throng. The honorable Frank J. Lausche, Governor of the state of Ohio, was the first to address the luncheon, welcoming the convention to the state of Ohio. Congresswoman Frances P. Bolton was the featured speaker at the luncheon on the subject of "Small Business and Government." Mrs. Bolton discussed at length her experiences during a trip to Russia in recent months, drawing parallels between life there and the attitude of the communist in Russia to the communist in this country. She dwelt at length, also, on her and other congressmen efforts to aid the small business man of the country and the effects of government control on small business.

After the luncheon the meeting again assembled in the Grand Ballroom and the first speaker of the afternoon was Paul B. Reed, Perfex Corp., Milwaukee, Wis., on the subject "The RSES Looks Ahead." In his talk

EDUCATIONAL PAPERS TO BE REPRINTED FOR MEMBERS

All of the educational papers presented at the convention will be reprinted in full and distributed to the membership, including reports of committees. Non-members may purchase the bulletin, including all papers, for \$1.50.

Mr. Reed outlined a very extensive educational program which he thought the Society could well embark on. He enumerated a number of ideas which would be productive of additional educational material for the individual member, and ways and means of carrying out this suggested program.

Russell Ayres, Engineer, Coolerator Co., Duluth, Minn., gave a highly practical talk on "Two Temperature Refrigerators," in which he discussed at some length the various refrigeration hook-ups for two temperature Refrigerators. In his discussion of the hook-ups he evaluated the advantages and disadvantages of each type of hook-up and talked of some of the developments in cabinets and



V. R. KRUSE

WILLIS STAFFORD

E. T. BENSON

M. GODDARD

Speakers on the Educational Program



The four pictures above are views of the RSES annual banquet, held in the Grand Ballroom, Hollenden Hotel, Cleveland. It was impossible to get the entire room in one picture. An overflow of 200 additional guests banqueting in an adjacent room are not shown in the photos.



RSES OHIO CHAPTER SLOGAN WINNER
Walter E. Wright, Cleveland, Chairman of the Ohio Publicity Committee, presents Wm. Kovacek, Medina Chapter, prize winning award for best slogan submitted by competing Ohio chapter members. Mr. Kovacek's slogan on Why I am a Member of the RSES was judged the best among the hundreds of entries submitted. His prize winning slogan was "For better knowledge through mutual experience and understanding."



During the final RSES business session the membership presented H. T. McDermott, International Secretary, with an honorary life membership and the above testimonial.



Some of the members of the Cleveland convention committees which made the convention a success. They are, 1st row, left to right: Mrs. R. Hollingsworth, Mrs. O. B. Herrick, Mrs. G. J. Schuld, Mrs. R. Burney, Mrs. L. Gardella and Mrs. Glen Keller. 2nd row: R. D. Chown, W. E. Wright, Dick Hollingsworth, R. C. Whitney, C. C. Harnish, Dick Burney, Geo. Baumgardner and Rod O'Flaherty. 3rd row: Joe Smylie, O. B. Herrick, Marty Grasso, Leroy M. Perkins, Paul Spring, Emil Hanik, Robert A. Smith and O. Nichols, Jr.

Photos on this page by Irving Alter

accessories. His talk was illustrated by the use of large charts.

V. R. Kruse, Woodstock, Ill., service engineer, and member of the Society, gave an interesting talk on a "Modern Refrigerator Service Repair Shop." Mr. Kruse showed a number of slides of his own shop and gave a detailed accounting of the thinking behind his plans for the shop. He explained the construction of the building, the layout of the shop and the equipment included therein, and his reasons for each selection. He also displayed some slides of what he thought was good truck design for the service engineer. In concluding his address he offered suggestions of improvements over his own layout for anyone who may be considering the construction of a new shop.

"Developments in Shaft Sealing" by Willis Stafford, Chicago Seal Co., Chicago, Ill., was a rather complete outline of the history and growth of the shaft sealing business. He traced various developments and improvements in shaft sealing from the first effort of sealing grease in wagon wheels to the present modern and simplified method of sealing refrigerant compressor shaft openings. His talk was illustrated with large charts of seals.

Monday Morning

The Monday morning session again opened with a question and answers period under the heading of "Information Please." It was conducted by A. M. Fenwick, Chairman of the International Educational Board, who was aided by a board of advisors selected from the audience.

The first speaker of the morning was E. T. Benson, Frigidaire Corp., Dayton, Ohio, on the subject "Responsibilities of Servicing Equipment in the Low Temperature Field." Mr. Benson's discussion dealt primarily with the problems of home freezers and the dis-





play cabinets for frozen foods. He discussed briefly the history of this equipment, but talked somewhat more extensively on good construction and the manufacturers' responsibilities; what part the selling organization should take in providing proper information to the customer; and, finally, the service organization's responsibility. Here he stated that it is the job of the service organization to advise users on correct methods of food processing, wrapping and freezing in the home freezer. He discussed at some length, various tests made by the Frigidaire Corp. in determining the length of time a freezer could be left without refrigeration before dangerous temperatures were reached in the freezer. He pointed out that the quantity of food frozen in the freezer was a large determining factor in the time required to raise the temperature to a dangerous point. His talk was illustrated by slides which included a showing of both modern and old cabinets made by Frigidaire.

"Recent Developments of Thermostatic Expansion Valves" was discussed by Monroe Seligman, Terney Engineering Co., Newark, N. J. Mr. Seligman's discussion was entirely on the valve made by his company, pointing out some of the advantages of their design; discussing the construction and operation of the valves under various conditions and comparing this construction with other designs. His talk was illustrated with large charts.

"Hermetic Units and the Service Engineer" by L. W. Larsen, Tecumseh Products Co., Tecumseh, Mich., was a very interesting talk on a subject close to the hearts of most servicemen. Mr. Larsen outlined some of the policies of his company, and others, in connection with servicing of hermetic units, and pointed out the difficulties in permitting units to be repaired outside of the factory. He gave some estimate of what it would cost a serviceman to equip his shop to adequately service and rebuild units, and some idea of the strict test and repair control which would be necessary to do a satisfactory job. He stated that while several offers have been received from service companies to handle the repair of hermetics, no permission has been given yet by the factory to do this work outside of its own shops.

Monday Afternoon

Monday afternoon was occupied by a choice of one of three tours, but it seemed that the majority preferred going to General Electric Co., Nela Park. The ladies were included. In these tours and busses were employed to take them from the hotel and return. About 400 were on the tour to Nela Park, where their facilities were so crowded that much of the tour program had to be abandoned due to a lack of time. This was extremely unfortunate for those who had to depend upon the busses to return, because there was so much to be seen and so much that was missed because of the large crowd in attendance. About 40 were on the tour to the Weatherhead manufacturing plant where they were shown the manufacturing processes of valves, fittings and various accessories used in refrigeration equipment. It was a very interesting tour and offered some real educational material to the men in the field who use this equipment.

Another group of 27 went on a tour to the Yoder Co., makers of evaporator plates, where they were entertained by inspecting the manufacturing processes of this plate and shown slides on the manner in which the plates operate in the refrigerating circuit.

The Annual Banquet

On Monday evening the annual banquet and dance was held in the Grand Ballroom, where approximately 800 attended. The crowd was so large that it was impossible to seat them all in the Grand Ballroom, and it was necessary to open the Assembly Room where approximately 200 were seated.

During the banquet Warren W. Farr presented a bronze plaque to William Kovacek of Medina Chapter for his prize winning slogan for the Society. The Ohio chapters had conducted a contest, in recent months, on the subject "Why I am a member of the RSES" and Mr. Kovacek's entry was selected. Gordon A. Burns, past International President, on behalf of the Society, presented E. A. Plesskott, Past President, with a plaque in appreciation of his splendid work and services from 1942 to 1945 as International President of the Society.

During the latter part of the evening, tables were all cleared from the ballroom and dancing occupied the balance of the evening.

Tuesday Morning



W. G. MacBRIDE

the servicing of ammonia machines and low pressure machines and branched into specific service instructions on York compressors in particular. The information he provided was practical and very helpful to those who come in contact with ammonia equipment.

"Preventive Maintenance of Air Conditioning Equipment" was discussed next by M. B. Goddard, Carrier Corp., Syracuse, N. Y. Mr. Goddard outlined much of the work which should be done during the spring start-up and fall shut-down, and during periodical inspections to prevent future breakdowns of the equipment. He enumerated points to be inspected and work to be done in the matter of regular periodical care. The need of maintenance contracts on air conditioning systems was clearly indicated in Mr. Goddard's discussion of preventive maintenance.

"Operation of a Refrigeration Service Business" by W. C. Irving, Santa Monica, Calif., was the next scheduled discussion. Unfor-

Photos on this page by Irving Alter.



tunately, however, the death of Mr. Irving's father a few days before his scheduled departure, prevented his attendance. W. W. Allison, therefore, took Mr. Irving's place, reading his paper and presenting the slides which illustrated it. Mr. Irving's paper was highly informative to the man operating his own business and desiring to expand into larger operation. He gave many helpful pointers on the management of a service business and explained his entire service and office routine, which was illustrated through the use of slides.

The last of the educational sessions adjourned at 12:30 P.M. on Tuesday, and at 1:30 P.M. of the same day the last business session was held. A discussion of unfinished business and new business occupied the first part of the business session. This was followed by reports of the Resolutions Committee, Auditing Committee and Credentials Committee, all of which were well received and accepted by the meeting.

Election of Officers

The annual election of officers followed and to the credit of the Nominating Committee, who had worked so long and hard in compiling their slate of officers, the entire slate as proposed was elected. Officers elected were: W. W. Allison, Los Angeles, Calif., President; Wm. Marshall, Toronto, Ont., 1st Vice-president; Chas. C. E. Harris, Cambridge, Mass., 2nd Vice-president; H. T. McDermott, Chicago, Ill., Secretary; C. J. Doyle, Omaha, Nebr., Treasurer; J. L. Driskell, Burley, Idaho, Sergeant-at-Arms. Directors — Walter E. Booth, Richmond, Va.; T. L. Burroughs, Houston, Tex.; Nap. Broosot, Quebec, Canada; A. L. Robertson, Madison, Wis.; C. S. Tucker, Birmingham, Ala.; Olin C. Yates, Seattle, Wash.; and Earl Yockey, Columbus, Ohio.

P. B. Reed, Milwaukee, was elected chairman of the International Educational Committee.

The interest in the educational programs of the convention and in its business sessions was evidenced by the fact that more than 600 were in attendance at every meeting. In all, it was a highly informative, very interesting educational program. The entire convention was well planned and thoroughly enjoyed by the visitors.

Credit for the success of the convention goes to the following working committees: *General Convention Committee*—Paul Spring, President Cleveland Chapter, General Chairman; Tom Way, Asst. to General Chairman; Warren W. Farr, International Director; George J. Schuld, Cleveland, Co-ordinating Chairman. *Educational Program Committee*—A. M. Fenwick, Cleveland, Chairman; Paul B. Reed, Milwaukee. *Entertainment Committee*—Dick Hollingsworth, Chairman; Rod O'Flaherty; Roy McCloskey; Robert Smith. *Reception Committee*—R. C. Whitney, Chairman, Tours; E. H. Wiedwald; H. L. Smith; C. R. Albright. *Publicity Committee*—W. E. Wright, Chairman; Marty Grasso; A. I. Linsley; W. C. Jarvis. *Housing Committee*—Emil Flanik, Chairman; O. B. Herrick; Joe Smylie; George Baumgardner; V. Flaugher; Jim Downs; Ed Ramsey; George J. Schuld, Jr.; Ed Vadakin. *Sergeant-at-Arms*—Dick Burney, Chairman; C. C. Harnish; Stanley J. Cwynar.

Ladies Auxiliary

THE ladies in attendance at the convention were provided for by a separate program of their own, in addition to the various entertainments such as the annual banquet, buffet supper, the luncheon and the tours. Arrangements for the ladies' program were made by the Cleveland ladies committee, headed by Mrs. Warren W. Farr, as Chairlady, and including Mrs. Glen Keller, Mrs. Lawrence Gardella, Mrs. Richard Hollingsworth, Mrs. Paul Spring, Mrs. O. B. Herrick, Mrs. William McCann, Mrs. George J. Schuld and Mrs. Richard Burney. They did an excellent job of welcoming the visiting ladies and arranging for their entertainment and enjoyment during their stay.

Among the entertainment provided for the ladies was a luncheon served at noon, Monday, October 28, just prior to the tour to General Electric, Nela Park. On Tuesday afternoon at 2:00 P.M. a bunco party was held, and prizes for the highest score and door prizes were provided.



MRS. R. C. McCARTHY
President

The business of the Auxiliary opened at 10:00 A.M., October 26, with Mrs. R. C. McCarthy calling the meeting to order. Mrs. G. W. Dresback, President of the Auxiliary, was called upon to address the meeting and introduced her fellow officers. Further introductions took place which served as a means of getting everyone acquainted. There were various reports from delegates on the activities

of their respective chapters, and Mrs. Dresback presented the Kansas City and Twin Cities delegates prizes for the most new members accepted since the last convention. A Nominating Committee, Auditing Committee and Resolutions Committee were appointed and the meeting adjourned until the afternoon.

New Officers

At the opening of the afternoon session, International President Buschkop addressed the ladies and offered a few words of greetings, then after a brief business session, new officers were elected as follows: Mrs. R. C. McCarthy, President; Mrs. A. W. Overman, 1st Vice-president; Mrs. John Bush, 2nd Vice-president; Mrs. John Sackey, Secretary; Mrs. Weldon Andrews, Treasurer; Mrs. J. K. Driskell, Sergeant-at-Arms. Board of Directors—Mrs. G. W. Dresback, Mrs. Dean Holmes, Mrs. Jules DeWilde; Mrs. Einer Hansen and Mrs. A. W. Albertson.

Immediately following the election, Mrs. Dresback turned the meeting over to the new officers and the business session continued. There was considerable discussion on the change in constitution and by-laws, and finally resolutions were passed recommending various changes.

4th All-Industry Exhibition Makes History

WITH four large exhibition halls in the Cleveland Auditorium filled with exhibits valued at \$1,500,000 the 4th All Industry Exhibition was by far the largest event of its kind held by the refrigeration, air conditioning or frozen food industries. About 227 exhibitors, occupying more than 280 booths, combined to produce a show excelling any that have gone before. The attendance exceeded the 20,000 estimated before the show.

Kenneth S. Wherry, U. S. Senator from Nebraska, champion of small business for many years, officially opened the exhibition in a ribbon cutting ceremony. Banked by leaders of the associations participating in the exhibition, Sen. Wherry cut the ribbons and opened the gates to visiting members of the industry.

The first two days of the show were hectic days for the exhibitors, due to the packed condition of all exhibit spaces and aisles. There was very little that could be purchased. The weather was warm and the exhibition

CLEVELAND SELECTED FOR 5TH EXHIBITION

The Board of Directors of the Refrigeration Equipment Manufacturers Assn. have selected Cleveland as the site for the 5th All Industry Refrigeration and Air Conditioning Exhibition, Jan., 1948.

halls unseasonably warm, but the enthusiasm of the visitor could not be dampened.

No business meetings were held by the Refrigeration Equipment Manufacturers Association during the four-day period. They did combine, however, with the Refrigeration Equipment Wholesalers Association in two



These views of the All Industry exhibition show top left—Senator Wherry cutting the ribbon in the opening ceremony. He is flanked on either side by heads of the participating associations. Top right—REWA registration booth. Bottom left—A view of the crowded aisles at the exhibition. Bottom right—Exhibition registration lobby.

Photos by Utilities Engineering Institute.

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are dependable

The extreme simplicity of construction that makes the precision-built A-P Thermostatic Expansion Valve so **DEPENDABLE** in long-life service is an additional advantage to the service engineer.

Every part of this important A-P needle assembly has been tested and inspected many times for its vital task of accurate refrigerant control. The Sellite needle, for instance, is made from special stock which must be subjected to chemical analysis and laboratory furnace to be absolutely sure every bar of stock has the correct percentage of every required element *before* machining and production. The finished assembly is checked under instruments working to *millions* of an inch accuracies, before its many operating tests.

Simple construction, easy installation and inspection, **DEPENDABLE** super-sensitive refrigerant control — are proven superiorities that keep A-P Refrigeration Valvesular with engineers and owners alike.

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DEPENDABLE REFRIGERANT VALVES

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AP



REMA and REWA members in joint luncheon session at Statler Hotel, Cleveland, October 31. About 300 were in attendance at this luncheon.



Ted I. Glou, President of REWA, presents President Herman F. Spoehrer of REMA check for \$2,500 for public relations program during joint luncheon.—Photo by Austin Jones.

luncheons, the first of which was held at 1:00 P.M., Monday, October 28th, and the other on Thursday, October 31st. The first luncheon was held at the Hotel Cleveland, and the second in the Grand Ballroom of the Statler hotel. Some 300 were in attendance at these luncheons.

REWA Meetings

A regional meeting of the Wholesalers group occupied Tuesday morning, October 29th, and a closed meeting of the entire group was held in the Statler Hotel Wednesday morning. Wednesday noon the Wholesalers held a luncheon for members and their wives.

All hotels in the downtown Cleveland area were filled to capacity with the more than 20,000 visitors in the city to attend the exhibition. As early as Friday and Saturday of the previous week, visitors were pouring into the city and housing committees of all associations were hard pressed to find suitable accommodations.



H. F. SPOEHRER
REMA President

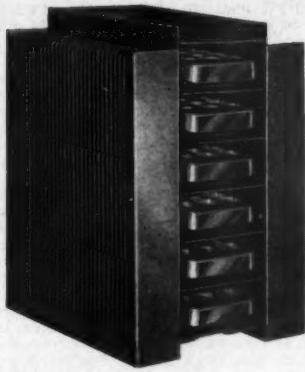


TED I. GLOU
REWA President

Gates to the exhibition were opened officially at 12 noon, Tuesday, October 29th, and closed again at 6 P.M. that evening. Wednesday they were opened from 12:00 to 6:00; Thursday from 12:00 to 10:00 P.M.; the public being permitted to enter between 7:00 and 10:00 P.M., and on Friday from 10:00 A.M. to 4:00 P.M. The show featured many moving displays of parts, applications, new techniques in refrigerating systems, practical installations and many educational displays.

Presenting

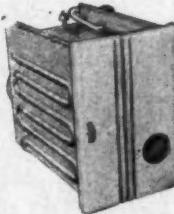
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TRIUMPH**
IN
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CONSTRUCTION



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WRITE FOR COMPLETE BULLETIN

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Chicago 6, Illinois

First Annual Meeting of NARC

THE first annual convention of the National Association of Refrigeration Contractors held in Cleveland, Ohio, at the Allerton Hotel, October 28 and 29, 1946, was most gratifying in attendance, in interest and in the number of refrigeration contractors applying for membership in the association. Registration for the two-day annual meeting was in excess of 300.

Warren W. Farr of Cleveland was re-elected president; E. S. Wright of Youngstown, Ohio, was elected first vice-president; J. F. Park of Los Angeles was re-elected second vice-president; Nathan Edelstein of New York City was elected recording secretary; and A. M. Palen of St. Paul was re-elected treasurer.

Four directors were re-elected: L. C. Anderson of River Forest, Ill.; W. L. Drake of Indianapolis; W. G. Euth of Detroit; C. R. Faulkner of Longview, Texas. Two new directors were elected: Ralph W. Lampie of Richmond, Va., and F. J. Zoppel of Columbus, Ohio.

The meeting was opened by President Warren W. Farr who outlined the activities and progress since the organizational meeting January 21 and 22. He told of the contacts established and maintained with other industry groups and Governmental agencies; and said that now, for the first time, refrigeration contractors had an organization to represent their interests in all such matters.

He pointed out efforts made to get a fair share of small motors and said that one possible source of leakage was stopped when they were put under export license control. He told of efforts made to alleviate the "Freon" shortage. Several conferences and a great deal of time and effort have been given to this matter.

Unfair trade practices is one of the most important problems confronting refrigeration contractors, and is being thoroughly explored with particular reference to practices of some of the dairies, frozen food concerns, and manufacturers of ice cream and beverages. NARC has accumulated quite a file on the subject, including complaints; and these have been turned over to the Federal Trade Commission, at their request, to supplement the formal complaint made to the Commission by an affiliated association, the Refrigeration Contractors Association of Northern California, with headquarters in San Francisco.

There appears to be no statistics on the business of refrigeration contracting. Such information is valuable as a guide to intelligent, constructive planning and corrective efforts. As a starter, a sheet was sent to all members, asking for information on sales volume, wage rates, etc. Replies are coming in nicely. Later, the summarized totals will be sent to members so they can compare these with their own figures.



New officers of the National Assn. of Refrigeration Contractors. They are, back row, left to right: F. J. Zoppel, Director, Columbus, Ohio; Lee Shirar; Warren Farr, President, Cleveland, Ohio; C. R. Faulkner, Director, Longview, Tex.; E. S. Wright, First Vice-president, Youngstown, Ohio. Front row: A. M. Palen, Treasurer, St. Paul, Minn.; L. C. Anderson, Director, River Forest, Ill.; W. L. Drake, Director, Indianapolis, Ind.; Nathan Edelstein, Recording Secretary, New York, N. Y.; W. G. Euth, Director, Detroit, Mich. Absent: J. F. Park, Second Vice-president, Los Angeles, Cal.; and R. W. Lampie, Director, Richmond, Va.

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VALVE

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✓ **Ample** diaphragm plus balanced, low-rate adjusting spring.

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✓ **Unmatched** sensitivity.

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CARTRIDGE NUMBER	CAPACITY IN B.T.U. PER HOUR		
	FREON	METHYL CH. SULPH. DI.	
1	750	1700	1710
2	1500	3400	3420
3	3000	6800	6840
4	6000	13600	13700
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A file on group insurance has been established, and the information is available to local groups to which this applies, because the laws of the states vary on this subject. Some information has been sent out on Apprentice Training, and the association is prepared to assist local groups or members on this matter.

Refrigeration contractors, he pointed out, now have their own trade association, whose principal object is to promote, protect and stabilize that business. An important and valuable file of the information on this business is being accumulated, and the association is prepared to act aggressively and thoroughly on any matters of interest and importance to this phase of the refrigeration industry.

On finances, Treasurer A. M. Palen of St. Paul said NARC had stayed well within its budget; and he recommended adoption of the proposed constitutional amendment to increase the per capita annual dues of affiliated associations, in order to obtain more operating revenue, needed to function aggressively and continuously on behalf of the membership.

The first speaker on the program was Raymond J. Shock, executive-secretary of the Refrigeration Contractors Association of Detroit. His subject "Is Licensing the Answer?" was based upon an investigation made by him and the Detroit group before a licensing ordinance was prepared and adopted in the Detroit city code.

The next speaker was Ed Wright of Youngstown, Ohio, recording secretary of NARC, on the subject "What NARC Means to Refrigeration Contractors." He emphasized the necessity of the refrigeration contractors getting together, working together and staying together in order to protect the investment in their business.

The second day of the contractors annual meeting opened with a paper on "Unfair Trade Practices," prepared by Z. E. Jones of San Francisco, executive-secretary of the Refrigeration Contractors Association of Northern California. Because Mr. Jones was unable to be present, his paper was presented by Lee Shirar of the same city. Mr. Jones voiced the opinion that the ensuing years will see more utilization of existing Federal regulations to safeguard business from unfair practices that cannot be held under control by voluntary means. He called attention to the Federal Trade Commission's Unfair Trade Practice Rules, which have been adopted with suitable modification in many industries; and expressed the hope that the refrigeration industry would adopt such a program.

Next on the program was Neal S. Tempchin, executive-secretary, Refrigeration Contractors Association of Los Angeles, on the topic, "Why Get Together Locally," and "How to Operate a Local Association." Mr. Tempchin listed va-

rious reasons for organizing a local association. He stated that action taken together is a great deal more productive than taken separately. When Governmental regulations are in force, the Government looks to the association for their aid and assistance in interpreting regulations. This performs a dual function—it builds a better understanding between Government agency and contractor, and a better understanding of the operation of the law. Under the heading of how to operate a local association, Mr. Tempchin offers some very sound advice to the various locals represented at the meeting.

Various committees made their reports during the latter part of the meeting and there was considerable discussion on unfair trade practices and various changes existing in the field today.

A luncheon meeting of the association was held in the Grand Ballroom of the Allerton Hotel, following adjournment of the annual meeting. The attendance was 210. Those at the speakers table included the new officers and directors and a visitor, Frank Dacosta, Panama Canal Zone member who had traveled 5,000 miles to attend the meeting.

The speaker at the luncheon was Mr. Edward Blyth, vice-president and secretary of Western Reserve University. His subject, "Reconversion and Reconstruction," was a plea for domestic and international cooperation as the only means of assuring a world peace with happiness and sound progress in our own country.

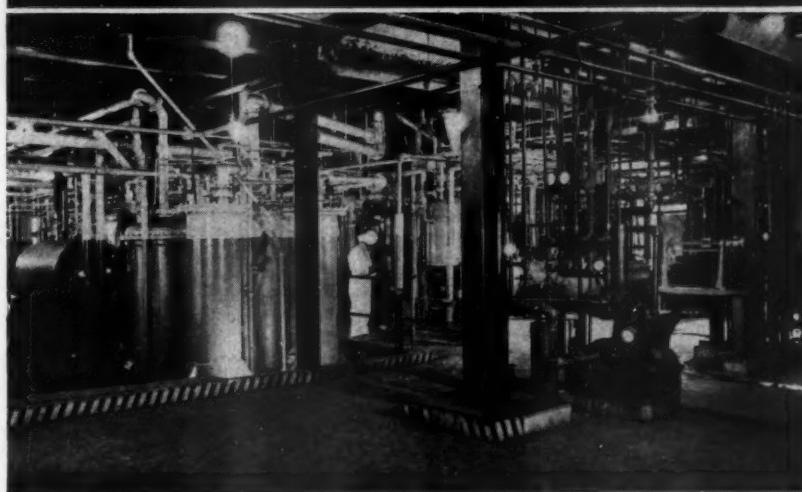


G. W. WESTON
Exec. Vice President



A before and after view showing what can be done with an old building. Ed Wright of Youngstown, Ohio, is responsible for the remodeling of this building which is the home of his contracting business. Ed has just been elected first Vice President of N.A.R.C.

Behind the Scenes in the "FREON" Plant



Complicated Equipment Produces this Safe, Non-Corrosive Refrigerant

This labyrinth of piping, valves, gauges and pumps is part of the plant where "Freon" safe refrigerants are made. Highly specialized apparatus—plus utmost care and "know how"—insures purity and uniformity . . . factors which guard against corrosion, oxidation or other injury to the precision parts of modern refrigerating systems.

From the very beginning, and throughout the highly complicated manufacture of "Freon"—a process requiring a wealth of technical knowledge—each step of the operation is under constant chemical and physical control. Rigid specifications must

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To insure long-lasting, trouble-free operation of modern, compact refrigerating systems . . . and to obtain maximum refrigerating satisfaction in commercial, frozen foods, and low-temperature industrial installations, specify equipment designed to utilize "Freon". Consult our Engineering Department for specific details. Write, Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.

IMPORTANT FEATURES OF "FREON" SAFE REFRIGERANTS

1. Freedom from moisture . . . less than 25 parts per million.
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3. Less than 2% of insoluble gases in vapor phase.
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safe refrigerants

"Freon" is Kinetic's registered trade mark
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Preventive Maintenance for Locker Plants

By PAUL B. REED*

While this paper was delivered before a meeting of locker operators and intended to point out to them the advisability of preventive maintenance on refrigerating equipment, it also points out the opportunity for servicemen in maintenance agreements with locker operators. Furthermore, it lists the things which should be checked or done on each routine inspection call and lists the things you should instruct the plant operator to do.

PREVENTIVE maintenance is a term that was coined by the Army, I believe, to cover a procedure that was found to result in decreased repair costs and fewer and less lengthy shut-downs of equipment. It is not a new procedure, for it is simply a fancy way of expressing the old adage "an ounce of prevention is worth a pound of cure."

Large installations of refrigerating machinery in packing houses, cold storage warehouses, and ice-making plants require enough day-to-day adjustment and repairs that the full-time or nearly full-time services of one or more skilled men are justified. These men are known as maintenance men.

At the other extreme is the household refrigerator or other small, automatic, individual cabinet and sealed mechanism, that may require no readjustments, repairs, or maintenance for years. Such an installation would certainly not justify a maintenance program.

In between these two extremes are many installations that—1. Consist of at least one or two systems of intermediate size, that although automatic in operation, do require some attention, although infrequent, such as oiling, defrosting, cleaning and minor upkeep. Locker plants, central station type air-conditioning systems, industrial processing equipment and the like come in this category.

2. Consist of quite a number of small, automatic, individual cabinets with sealed, semi-sealed, and belt driven mechanisms.

*Manager, Refrigeration Div. Perfex Corporation

Apartment houses, army camps, ships, factories, large stores, operators of "fleets" of refrigerated vending cabinets and other users of multiple installations come within this category. Some of these may even be able to keep one or more repair or maintenance men busy on a full-time basis.

The annual cost of repairs or very considerable losses due to spoilage of perishable products stored, can very well justify a moderate expense for a procedure that will reduce the repair costs or damage losses.

Most locker plants use refrigerating machines from about one or two horsepower up to twenty or twenty-five horsepower. Repairs, especially those involving major replacements, may quite easily amount to one hundred dollars or more with perhaps no assurance that there will be no repetition.

But, of perhaps even greater importance to the locker operator is the possibility of a lengthy shut-down during the repair period, due, perhaps, to unavailability of repair parts or prior claims to the time of the service engineer. Losses from spoilage of the frozen foods stored in the plant can assume the proportions of a catastrophe.

Procedure Should Reduce Costs

Any locker operator will agree that any procedure that is effective in reducing repair costs and in lessening the possibilities of product losses would be worthwhile and worth a moderate expenditure of money. Incidentally, it will be noted here that the cost of Preventive Maintenance is an expense of operation and as such enjoys a favored place as a deduction on the income tax return.

Just what is preventive maintenance? Briefly, it consists of regular inspections that find little defects before they get large, so that they can be repaired easily, quickly, inexpensively and without a major shut-down. It consists also of oiling, cleaning and readjusting that will prevent excessive wear and the consequent expensive repairs.

In practice, it consists usually of a contract or agreement with a reliable service company or individual to visit the plant every two weeks or every month, as may be

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determined, and carefully inspect the equipment, check temperatures and pressures, oil all bearings, conveyors and other frictional parts, clean condensers and perhaps defrost the evaporators if it seems desirable for the service engineer to do this. (There is an advantage in his doing the defrosting for troubles sometimes show up when the equipment is started up just after a defrosting, and the service engineer, being there, can immediately make the necessary readjustment or repair).

These preventive maintenance contracts are usually on a yearly basis with flat-rate fees to cover the labor and transportation for the inspection, oiling, readjustment and cleaning of the equipment, but not including parts, materials or supplies. Neither do they cover the labor, material, parts nor transportation for any repairs that may be found necessary. Some contracts do include the labor for specified minor repairs such as belt tightening, realigning and replacement or repair of minor leaks.

The following items would be on a typical check-list of the service engineer on a preventive maintenance inspection:

1. Put on gauges and check and record discharge and suction pressures.
2. Check and record temperatures in the various rooms or refrigerators.
3. Check and record temperature of the machine room.
4. Check and record temperatures of the water to and from the condensers.
5. Check the amount of refrigerant in the system and if low, test the entire system to locate the leak or leaks from which the refrigerant was lost.
6. Check tension of belts and alignment of pulleys.
7. Inspect all evaporators for operation. If one is not fully active or all frosted, the cause must be determined and the necessary repair made. Check blower type evaporators for accumulation of frost or ice in the fins that prevents or retards air passage.
8. Oil bearings of motors, fans, pumps, idler pulleys, conveyors and similar apparatus.
9. Clean sediment traps, check spray heads and eliminators of evaporative condensers, clean and repaint rusty water and drain pipes, tighten valve glands or repack if required.
10. Inspect and clean ductwork and wire-brush and repaint if needed.
11. Check door gaskets and hardware for tightness and free operation. Oil hinges and latches.

12. Clean dust and lint from air-cooled condensers and check free air supply of evaporative condensers.

If mutually agreeable arrangements can be made, the locker operator may find it advantageous to have the refrigeration service preventive maintenance program include the other mechanical equipment used in the plant, such as power saws, meat grinders and slicing machines, unless a separate preventive maintenance arrangement may be made with dealers or other organizations available for repair service on these accessories.

Some few locker operators may have sufficient knowledge and experience with refrigerating equipment that they may feel capable of doing the preventive maintenance themselves. Nevertheless, they will probably find it advisable to turn this work over to the refrigeration specialist who does this type of work all the time and can make the inspection quicker and more effectively. Moreover, the locker operator will be inclined to pass over the inspection if it comes at a time when he is busy with other work and the probabilities are that it will not be done at all.

Instructions for the Locker Operator

There is a place for the locker operator in the preventive maintenance program, however. He can watch the day-to-day operation and see that nothing is done that will tend to cause uneconomical operation or to actually cause damage that may result in costly repairs or shut-downs. Even preventive maintenance cannot anticipate nor prevent some of the things that the operator can prevent or at least correct at once. Some of these things are:

1. Keep the doors closed. Some of the larger doors are the self-closing type but smaller ones may be left open longer than is necessary. Much warm, moist air, may be let into the cold spaces. The heat will cause the temperature to rise in the refrigerated rooms or cabinets and the moisture will add frost on the evaporators or cause condensation, frost on lockers, food or equipment.
2. Prevent obstructions to air circulation in the rooms or cabinets. Air passages must be kept open. Boxes and cartons may be piled in passages, food may be packed solid or paper may be put on shelves; all of which obstruct the circulation of air which is necessary; for the circulating air carries the refrigeration to the points where it is needed.

Safe Refrigeration

builds more customers for cabinet manufacturer



The new Kold-Hold factory. From it, in steady flow, come those adaptable, flat, tubeless refrigeration plates. In locker plant space cooling, for stands, banks, shelves . . . or in refrigerated trucks, efficient flat Kold-Hold evaporator type plates give satisfaction through superior performance. This Company has another use . . . the liner cooling unit in frozen food cabinets.

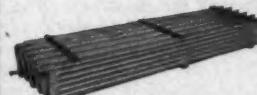
This is a happy grocer. He has solved the problem of displaying packaged frozen foods. His supply rests in a 20 cubic foot storage compartment, completely lined with one Kold-Hold Liner. Angled mirror displays entire line to customers . . . packages are stored at safe temperatures below the black border.



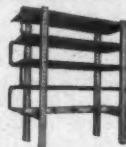
This is a happy shopper. The cabinet with the Kold-Hold liner permits her to walk right up to the display. When she makes her purchase, she gets a crisp, dry package, cool to the touch, with contents properly temperatured . . . cold enough to hold until it's transferred to her own home locker or refrigerator.



*Name of mfg. on request.



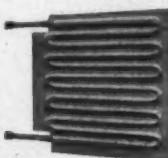
These Kold-Hold plate bank units are suspended from the ceiling, replacing cumbersome pipe coils, providing constant, economical temperature.



Kold-Hold serpentine plate stands are designed for sharp freezing and holding. Plate stands are connected in series.



Kold-Hold liner fabricates serpentine plate evaporators into one unit, eliminating refrigerant joints, giving uninterrupted flow.



Single Kold-Hold plates can be obtained in practically every size and adapted to an amazing number of uses.



Kold-Hold "Hold-Over" truck plates create greater pay load space . . . cold is built up at night and holds desired temperature for the day's run.

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3. Prevent obstructions to air circulation around the machines. The machines must have free air circulation to enable them to keep cool. In the case of air-cooled machines, all of the heat from the cold rooms or cabinets is carried by the refrigerant down to the refrigerating machine, and thrown off by the air-cooled condenser into the room or other space around the machine. If that space is too small or air circulation into and out of it obstructed, the machine will get hot and as a result its efficiency and ability to remove the heat from the rooms will be reduced and the cost of operation will go up. In the case of the water-cooled machine, the heat from the rooms is transferred to the water in the water-cooled condenser so less circulation of air around the machine is required than for air-cooled machines. But some is still needed to carry away the heat from the motor, and since water-cooled machines are usually in the larger sizes with good-sized motors, the amount of heat from the motors is considerable. Even a water-cooled machine must not be crowded into too small a space.

4. See that cooked foods are allowed to

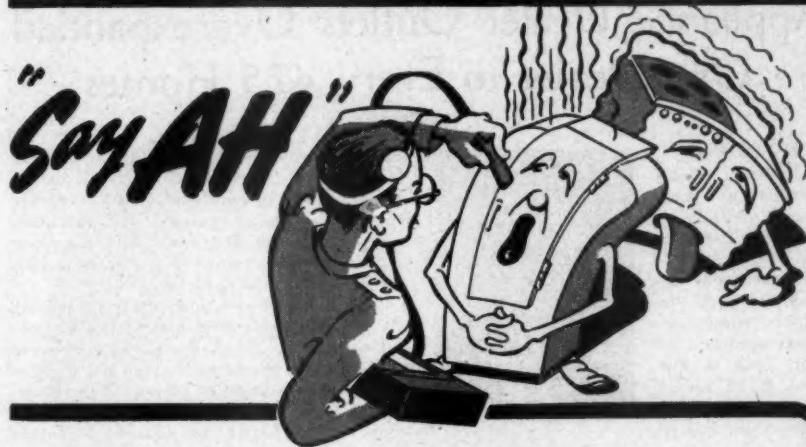
cool down to room temperature before they are put into chill rooms. Also see that foods are cooled down to at least around 40° before they are put into the freezer. Refrigeration costs more to produce in the low temperatures than at chill room temperatures, so do as much of your cooling as you can at the higher temperatures, or in the case of hot foods, without refrigeration at all.

5. Keep the refrigerated rooms and cabinets clean. Wash down at least each week the interior walls, shelves, meat rails and the like in the spaces that are held above freezing. Other equipment such as tables, floors, cutting and grinding equipment should be washed each day. One tablespoon of baking soda in each gallon of the washing water or some good commercial preparation will tend to keep things sweet.

Keep the refrigeration equipment clean, too. Your refrigeration preventive maintenance man should wipe off the machines, motors, condensers, fans, etc., and you should avoid getting your hands around moving or electrically "hot" parts. That is his job but you can see that the floors and walls around the equipment are kept clean and dry.



Paul Haganan and his son are owners of a refrigeration sales and service business in Park Falls, Wis. Last summer they sold a Sanitary 12 cu. ft. freezer to a resort on Hines Island in Mason Lake which created the immediate problem of transportation to the island. The problem was solved, as pictured above, one Sunday with the aid of a few friends. Loading the freezer on two boats tied together (1) they're off to a good start, and after a goodly amount of bending on the oars they arrive (2) at Hines Island, but (3) oh! oh! 45 steps up.



Doctoring sick refrigerators and ranges is a profession. To make it pay, you've got to diagnose the trouble and cure it as fast as possible. If you guess wrong the first time, the call may cost you money.

Besides, it makes a better impression when the job is done in a business-like, scientific way. And don't overlook the fact that if handled properly, today's service builds tomorrow's sales.

J-B-T's new Model 60-JRT Appliance Temperature Tester, designed for servicemen, factory maintenance men and maintenance engineers:

Get one from your jobber.
Put it to work for you, today.

- Measures 4 cold zones and 2 heat zones with one setup.
- Gives continuous readings while doors are closed.
- Backs up servicemen's recommendations, shows customer the facts.
- Combines laboratory accuracy with sturdy construction needed for hard, everyday use.

J-B-T INSTRUMENTS, INC.

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Appliance Dealer Outlets Overexpanded One Dealer to Every 475 Homes

FURTHER expansion in the number of retail dealer outlets in the electrical home appliance field may seriously affect the entire industry when business conditions revert back to normal, H. M. Kelley, Frigidaire appliance sales manager, told members of the International Association of Electrical Leagues during an October meeting in the Hotel Astor in New York City.

"The transition from a sellers' to a buyers' market will cause a high mortality rate among retail appliance dealers," Mr. Kelley declared. "We, as an industry, will never be better off than our retail dealers."

Mr. Kelley pointed out that recent surveys show there is one major appliance dealer for every 485 homes in the country today. "Prewar, there were in the United States about 25,000 major appliance dealers for 25 million electric meters—or about one dealer for every thousand wired homes," he revealed. "Best estimates today show that there are between 50,000 and 60,000 dealers—not including chain stores expressing the desire to go into the appliance business." He disclosed that there is one dealer for every 475 metropolitan homes and one for every 300 electric meters in rural sections.

Mr. Kelley contributed the expansion in the retail appliance field to two principle factors—returning war veterans and promise of future security. "There are literally thousands of returning war veterans who desire to go into business for themselves," he said. "Moreover, it was an accepted fact that the appliance industry weathered the last depression better than most any other hard goods line. The tremendous accumulated demand for appliances has been widely heralded and the field is relatively easy to enter.

"As a result of this tremendous increase in the number of appliance dealers," the appliance sales manager continued, "we be-



H. M. KELLEY

lieve that a very high mortality of dealers is bound to follow in the not too distant future. Lack of capital, inability to secure brand name franchises, poor store locations, inexperience in merchandising, improper guidance by manufacturers, and poor customer service will result in failure."

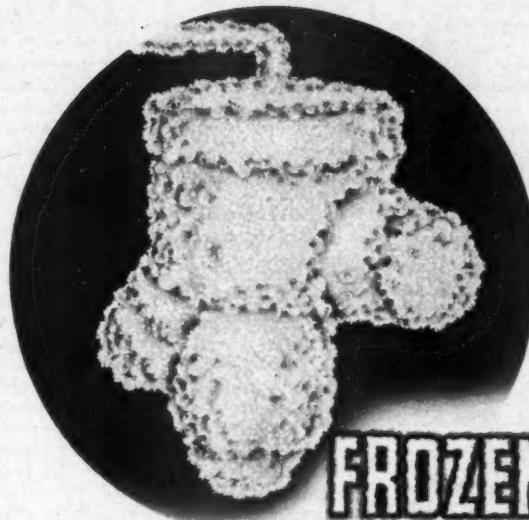
"When this dealer mortality rate reaches its peak, we can expect a most chaotic condition to exist," Mr. Kelley said. "If a dealer is to steer his operation through this dangerous period successfully, he must 'sell to survive'. To survive the adjustment period he must sell his brand; sell against the future orphan brand; sell his product features and sell his service, integrity and business stability. Cut-throat tactics will only lead down the spiral of price slashing to destruction."

Unfilled Orders or "Desires"

"The transition from a sellers' to a buyers' market may be fairly rapid," Mr. Kelley declared, "but will vary with different appliances and markets. It is important for us to realize that the backlog of unfilled orders, caused by the lapse of appliance production during wartime, strikes and shortages, are essentially 'unfilled desires'. Whether or not these desires will be translated into a firm demand will depend upon the degree of confidence that the public will have in the future when that point has been reached. Because of this it is possible that the transition may be more rapid than we would be inclined to think at this time."

"In considering the transition, we should take into account the probability that all types of markets will not react in the same manner and at the same time. The rural market, for example, promises to be stable for some time, providing crop prices hold up. The farmer today has more cash, greater assets and lower indebtedness than at any time in recent history. This favorable situation for the appliance industry has been and will be further enhanced by widespread electrification of rural areas by both private utilities and the R.E.A."

"By contrast, the larger urban markets seem to be in a more vulnerable position. Strikes continue to cut into the industrial



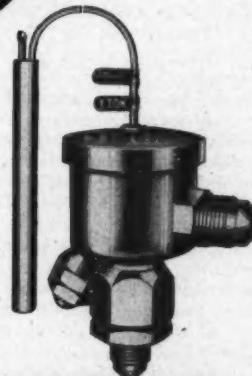
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The THERMO-LIMIT also limits pressure to prevent motor overload—and you can easily change pressure, capacity and super-heat in the field.

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workers annual wage; resulting material shortages have caused intermittent lay-offs of workers in countless plants. Consequently some of these families probably have had to dip heavily into wartime savings. Higher prices of food and clothing are calling for an ever larger share of the income of the salaried and industrial worker. These conditions certainly will affect the sale of appliances.

"However, regardless of these factors, a sellers' market is expected to continue for some time—but in varying degrees in relation to specific appliances," he explained.

Buyers Market Soon

Mr. Kelley pointed out that in the case of refrigerators, it appears that the sellers' market will last until the middle of 1947. "However," he said, "there is much duplication on dealers' prospect lists, prices are rising and earnings are reduced. Therefore, the backlog of demand may be reduced so that a buyers' market for refrigerators may arrive sooner than is expected.

"The demand for electric ranges is unusually firm. This demand is probably resulting from a different set of factors. There has been a tremendous increase in the public acceptance of the electric range as well as marked acceleration in the interest and promotional effort of public utilities.

"The potential market for electric water heaters is greatly improved over prewar days. This is probably due to increased appreciation on the part of the homemaker for an adequate supply of hot water. There have also been shortages of domestic help. More and more homemakers are turning to automatic washers; consequently automatic hot water is important to them. Electric rates are being decreased by utilities, providing more economic operation.

"Turning to yet another appliance—one which many have considered the 'white-haired boy' of the appliance business—the home freezer, there is a wide difference of opinion regarding its potentialities. Estimates of sales have run all the way from 300,000 to over two million units a year. We believe that this market has been greatly overestimated. Sizable casualties are being predicted in this field. It is believed that this product is already in the buyers market. In urban markets the home freezer is a luxury item. The availability of frozen foods, rented home freezers, locker plants and greater storage space in home refrigerators are having a depressing effect upon

home freezer sales in these areas. In the farm market where the home freezer can be justified on economic grounds, the market has been oversold as to the capacity needed," Mr. Kelley added.

"The overall appliance market sales trends often cast their shadows far ahead of their time. Major appliances normally being items which are sold on time payments, are particularly susceptible to buyer influence considerably ahead of the time when the buyers' resistance is felt in other types of consumer non-durable merchandise. However, today with a high percentage of cash sales as compared with normal times, and with time payments limited to 12 months, we are not in as good a position to evaluate the buying public's confidence in its ability to pay in the more distant future. Relaxation of Regulation W, of course, promises additional potential for major appliances and, at the same time, will more accurately reflect the confidence of the buying public in future economic conditions of the country."

Mr. Kelley urged a co-operative program for the Major Appliance Industry and the Electric Leagues Association. His 11-point proposal basically included the following recommendations: Better business counseling for dealers and prospective dealers; promotion of adequate electrical home wiring facilities; promotion of the advantages of electrical home appliances with special emphasis on large-capacity water heaters and ranges; promotion of complete kitchen and laundry units, and better public and dealer relations.

BOOK REVIEW

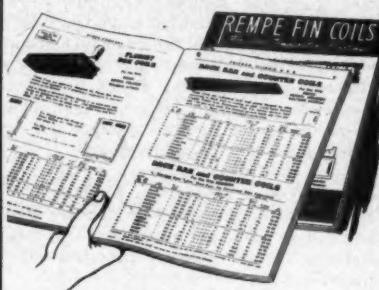
TRANE AIR CONDITIONING MANUAL. Published by the Trane Company, LaCrosse, Wisconsin, manufacturers of heating, cooling and air conditioning equipment. 376 pages. Size 8x11", bound in permanent buckram binding. Price 5.00.

This is the seventh edition of the Trane Air Conditioning Manual which has been kept up to date at all times and is now revised. Prepared for use as a handbook for engineers or a textbook for students, every phase of air conditioning has been thoroughly covered. The volume consists of 376 pages divided into eight chapters: Heat, Comfort, Heat Gains, Properties of Air and the Psychrometric Chart, Calculations for the Conditioned Air Supply, Refrigeration for Air Conditioning, Water for Air Conditioning, and Duct and Fans. Pages 291 to 361 are devoted to reference tables to present data in a simplified form and to avoid

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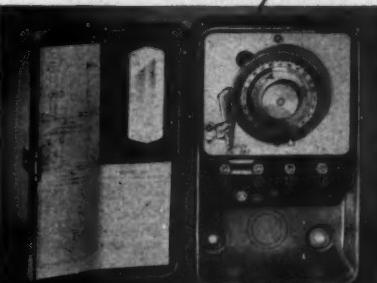
You'll find a great wealth of practical and helpful information in this Rempe Catalog No. 120 on Fin Coils for Low Temperature Cooling. Pertinent information is given on How to order—Overall Coil dimensions—Sq. Ft. of Surface—B.T.U. Capacity—Size and Type of Coil to be used in various Refrigerators and Display Cases.

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MANUFACTURERS OF ELECTRICAL EQUIPMENT SINCE 1893

the time-consuming use of mathematical formulas. Its value as a text for self-study is enhanced by the problems which accompany each chapter with answers in the back of the book.

One of the most valuable sections of this book is the portion devoted to the properties of air, clarified by illustrations and descriptions on how calculations are made. As in the past, psychrometric charts, cooling load estimate sheets and a specially designed air conditioning ruler to facilitate the computing of air quantities and characteristics are included with this book.

The Trane Air Conditioning Manual has been accepted as a textbook by colleges and universities and is widely used by leading engineers for a reference volume.

BOOK REVIEW

ELECTRIC MOTOR REPAIR. By Robert Rosenberg. Published by Murray Hill Books, Inc., New York, N. Y. 551 pages. 900 illustrative drawings. Spiral binding forming two books in one cover. Illustrations in one book and text in the other. Price \$5.00. For sale by Nickerson & Collins Co., 433 N. Waller Ave., Chicago 44, Ill.

Here is a book that explains all details of modern motor repair work. Every step is made crystal clear, both by text and by over 900 detailed illustrations. Not only is Electric Motor Repair by Robert Rosenberg designed for home study by beginners—equally important, it has been prepared for actual bench



use in determining exactly what to do and how to do it on every type of electric motor brought in for repairs.

Motors are more widely used than any other type of moving electrical appliance. Hence, the repair field is a vast one, and Mr. Rosenberg covers it from A to Z. Every problem pertaining to trouble diagnosing, troubleshooting and repair is explained—right down to completely detailed data on how to rewind motors. Coverage extends from the big motors used in industry to the millions of fractional horsepower motors in everyday use in homes and offices. Both alternating-current and direct-current motors are covered fully, as are mechanical and electronic motor control systems and synchronous motors and generators.

Every subject discussion is followed by a quick-reference guide to the handling of specific details on specific jobs. Theory is held to the bare minimum necessary to an understanding of the intensely practical side of the work.

No guesswork! Nothing impractical or hard to understand. Years of experience as instructor in the motor repair shop of a leading vocational school have given Mr. Rosenberg an unsurpassed insight into exactly what instruction is necessary—and exactly how it should be presented for quick, easy and complete understanding.

BOOK REVIEW

THE REFRIGERATION INDUSTRY. By David C. Choate. Published by Bellman Publishing Co., Inc., 6 Park Street, Boston 8, Mass. 32 pages. Price \$1.00.

This monograph is one of a series of seventy-five occupational booklets used in connection with guidance activities wherever general counseling work is conducted and

(Continued on page 78)

PRODUCTION BOX SCORE

CONSUMER DURABLES	SEPTEMBER	AUGUST	PREWAR MO. AVG.
Automobiles	239,000	241,000	312,942 (1941 Mo. Avg.)
Passenger tires	5,900,000	5,800,000	4,200,000
Truck and bus tires	1,400,000	1,300,000	900,000
Refrigerators (mechanical)	233,000	218,000	309,000
Washing Machines	212,000	215,000	158,000
Sewing Machines	35,000	29,000	67,000 (1941 Mo. Avg.)
Gas ranges	153,000	169,000	125,000 (1939 Mo. Avg.)
Electric ranges	61,000	66,000	47,000
Vacuum Cleaners	240,000	218,000	156,000
Electric Irons	697,000	664,000	380,000 (1940 Mo. Avg.)
Radios	1,500,000	1,700,000	1,100,000

REFRIGERATION SERVICEMEN

Your customers who own Meter-Misers depend on you to keep them in operation.

Don't let them down for lack of refrigerant to recharge these FRIGIDAIRE units—Get a supply of

HERVEEN 

the IDEAL REPLACEMENT GAS

Customers and servicemen alike are finding this gas measures up to their standards of performance in Meter-Misers. Servicemen experience no difficulty in making this replacement to the complete satisfaction of their customers. Meter-Miser service becomes a routine call to the shop that carries a supply of HERVEEN.

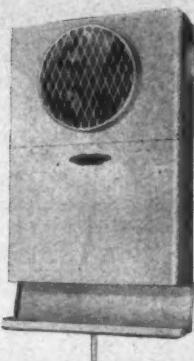
Send for bulletin on
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Meter-Misers with HERVEEN"

For deliveries, see your local jobber or write to

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Refrigeration Service Engineers Society



Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

INTERNATIONAL HEADQUARTERS:
433-435 North Waller Ave., Chicago 44, Ill.

Illinois State Association 9th Annual Convention Draws Good Attendance

THE ninth annual convention of the Illinois State Association, held in the Stevens Hotel September 21-22, was a success from its beginning Friday night, September 20, to its end Sunday afternoon.

Attended by more than 200 registrants, the meeting was highlighted by two educational sessions during which several interesting papers were presented; by a banquet in the Skyroom of the hotel, and by Herman Goldberg's party, the main entertainment feature of the convention which attracted an additional 200 visitors.

For the benefit of the early arrivals and those who wished to register early, the registration booth was opened Friday evening. A formal get-together was held in the West ballroom, where a questions-and-answers period and general discussion was conducted by Paul Reed, chairman of the Wartime Educational Committee. Saturday morning the convention was officially called to order by President William C. Metcalf. The morning session was devoted entirely to business affairs, such as reports from the secretary and treasurer, appointment of nominating,

auditing and resolutions committees. The first part of the Saturday afternoon session was devoted to an educational program and first to be called upon was Jack Glass, chairman of the Central Refrigeration Wholesalers Association, who gave a talk on jobber-serviceman relationship. Mr. Glass is also president of the Chase Refrigeration Supply Co. in Chicago.

Low Temperature Expansion Valve Problems, by F. Y. Carter, Detroit Lubricator Company, was the second paper of the meeting and proved to be a very interesting discussion on the problems of designing and providing a suitable expansion valve for two and three stage low temperature refrigerating systems where the temperatures maintained are from -40° to -125° F. The latter part of this meeting was devoted to business, during which a report of the nominating committee was received and the election of officers took place. Officers elected were: John Sackey, Galesburg, *President*; F. Lilley, Chicago, *First Vice-President*; William J. McCarley, Joliet, *Second Vice-president*; R. E. Saunders, Bloomington, *Secretary*; R. Porter, Bloomington, *Treasurer*; and L. Sturch, Rockford, *Sergeant-at-Arms*.

The annual banquet was held in the Skyroom at 6 P.M. Saturday night. It was an enjoyable dinner with more than 200 in attendance. H. T. McDermott, International Secretary of the Society, was the speaker for the evening, and roving entertainment in the form of two girls with an accordion and a violin entertained at the various tables. Immediately following the banquet everyone was invited to attend Herman Goldberg's party held in the North ballroom on the third floor of the hotel. More than 400 were in attendance at the party which, as usual, turned out to be a huge suc-

COMING CONVENTIONS

Alabama State Meeting

Place: Whitley Hotel.
City: Montgomery, Alabama.

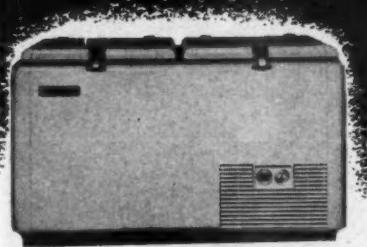
Date: December 2, 3.

Secretary: W. C. Goodwin, 14 Country Club Drive, Montgomery, Alabama.

Iowa State Meeting

City: Davenport, Iowa.
Date: January 25, 26.
Secretary: Clarence Brashaw, 835 Main St., Dubuque, Iowa.

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- ★ THICK INSULATION
(Hermetically Sealed)
- ★ MODERN, SMART DESIGN
- ★ ECONOMY-ENGINEERED

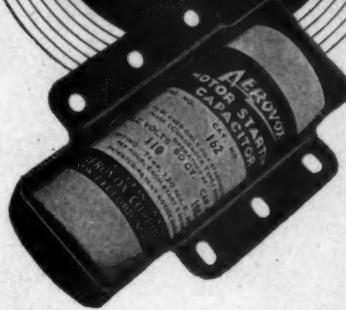
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Views of the Illinois State Association meeting held in the Stevens Hotel, Chicago, September 21, 22. New officers elected (1) are, left to right, R. E. Saunders, Secretary; John Sackey, President; Wm. J. McCarley, 2nd Vice Pres.; R. Porter, Treasurer; F. Lilley, 1st Vice Pres. L. Sturch, Sgt.-at-Arms, is not shown. Views 2 and 3 were taken during the meetings. 4, 6, 7 and 8 were taken during the annual banquet. 5 at the ladies' luncheon. 9, 10 and 11 at Herman Goldberg's party held immediately after the banquet. Photos by Irving Alter.

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VISOLEAK detects even the smallest leaks before they cause damage to expensive refrigeration systems. Years of use prove it safe, economical, easy to use.

NEW CHARGING SET

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Charging Set—complete with hoses \$7.50
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WHOLESALE PRICES

	4 ounce bottle	48 bottles
4 ounce bottle	\$ 1.00	48 bottles
8 ounce bottle	1.75	24 bottles
1 pint bottle	3.00	24 bottles
1 quart bottle	5.00	12 bottles
1 gallon can	16.00	6 cans

SAVE 10% ON CASE LOTS

See your refrigeration supply jobber or write for complete information.

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We completely disassemble controls, clean, test, check and replace defective or broken parts, and set for proper temperatures.

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Until further notice, do not send in Automatic or Thermostatic expansion valves for repair.
90 day guarantee ★ Prices F.O.B. Chicago

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EVEN AN EXPERT
IS SOMETIMES
STUMPED



Like the checker-playing expert, the refrigeration serviceman—old-timer or youngster—sometimes finds himself up against a problem, the answer to which he either cannot remember or never has learned. Yes, servicemen are often stumped—and that's why so many of them turn to Utilities Engineering Institute for the training they know will give them the thorough brushing-up they want.

How highly refrigeration concerns value U.E.I. training is proved by the PHILCO CO. which has again called on the Institute to train members of its service organization.



U.E.I. BALANCED TRAINING

A high-quality method of training that combines practical home study with technical shop practice. It's the course which men in refrigeration are today putting to profitable use. How about you? When you find yourself stumped, it's time to arm yourself with the right answers.

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City State

cess. Mr. Goldberg provided door prizes and various stunt prizes for those in attendance, and several acts of entertainment provided an excellent floor show. Dancing rounded out the balance of the evening.

Sunday morning the installation of new officers occupied the larger part of the business session and on the educational program, efficient air conditioning service was discussed by M. B. Goddard, Carrier Corp., Chicago. In a very interesting paper Mr. Goddard pointed out some of the essential things to provide in air conditioning service and some rather general instructions on the repair of certain troubles. He described, in some detail, the construction and servicing of Carrier compressors and the usual procedure necessary in starting up and shutting down air conditioning system.

Getting Down to Business by Waylan Clark proved a very enjoyable paper. Mr. Clark discussed human relations in business in his usual easy-flowing manner, throwing in a good deal of humor in his discussion which helped so much at an early morning meeting.

Unfinished business, report of the Resolutions Committee and consideration of the next convention city wound up the business affairs of the convention meetings. In the resolutions passed credit was given to the hard working committees which had been instrumental in making the convention a success. These committees were: Entertainment, Floyd Lilley, Martin Brunderman, Edward

Riccio; Publicity, Dick Hendrickson, Willis Stafford. Special mention was made of the fine work done by General Convention Chairman D. D. Orr. Part of the work of the Publicity Committee was the production of a 32-page program which contained quite a large amount of advertising and pre-prints of all the educational papers. A sufficient quantity of the programs was published so that after the convention a copy could be mailed to every member at large in the state of Illinois and to each chapter secretary in Illinois and surrounding states.



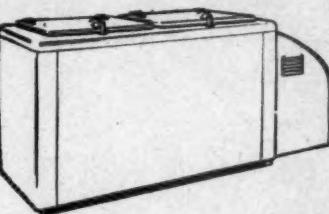
Canton Regional Chapter received its charter at a dinner meeting September 17. Clarence Buschkopf, Acting International President, center in the picture above, presented the charter to Carl F. Howenstein, President of the Canton Chapter, while William Kuhns, Secretary, looked on. C. E. Parks, residential sales manager of the Ohio Power Co. was a visitor and speaker of the evening. The meeting was attended by 29 charter members and their wives, bringing the total attendance to 63.



The Beehive Chapter annual banquet held in Salt Lake City. After dinner, Mr. J. M. Schlemmer, General Controls Co., Glendale, Calif. talked on thermostatic expansion valves and their application. By using a glass evaporator coil, the flow of refrigerant could be seen through the coil. By changing the cartridge orifices in the expansion valve, Mr. Schlemmer demonstrated that it was necessary to have the correct size of valve to properly refrigerate the coil.

FREEZER CABINETS

Worthy of YOUR
Best Equipment



SANITARY 12.5 Cubic Foot Models Available Complete, less Condensing Unit

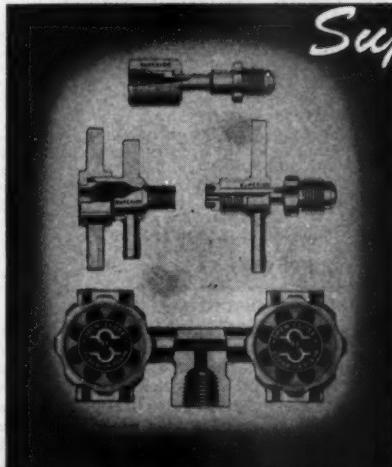
Heavily built with steel welded frame, SANITARY Freezer Cabinets are now in limited production for shipment on a 30 to 60 day basis. Each cabinet is complete with freezer plates, cold control and Freon 12 expansion valve requiring merely installation of your own condensing unit. Every detail in these Freezer Cabinets is aimed at high efficiency at lowest operating costs.

PLACE YOUR ORDER
for these "top quality"
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Manufacturer

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Ice Refrigerators For More Than 40 Years
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LOS ANGELES CHAPTER MEETING FEATURES HOME ECONOMICS TALK

ON SEPTEMBER 25, 1946, the Los Angeles Chapter devoted their meeting to "Ladies Night." Approximately 150 attended. To make this meeting interesting to the ladies and profitable to the men, Prudence Penny, Home Economics Editor of the Los Angeles Examiner, was obtained as the speaker of the evening. Her topic, "Frozen Foods from the Freezer to the Table," proved to be an ideal topic for the occasion and she held the interest of the entire group. The chapter was fortunate in obtaining the services of this outstanding food authority.

Her talk was built around proper and improper methods of defrosting and preparing frozen foods. According to Miss Penny the problem of whether to defrost before cooking or not was important in the case of some foods; but in other cases was purely a matter of expediency. She was careful to point out what to expect if cooking was started before defrosting, and the difference that should be expected if defrosting was completed before cooking started.

Some of the foods which she actually cooked prior to the meeting, included a 17 lb. turkey, various vegetables, a pie, different seafoods, and some bakery goods. One interesting display was a chicken that had been roasted in foil wrap and prepared with a barbecue sauce inside of the foil wrap before roasting. In talking about this chicken, some time was spent by Miss Penny in explaining the proper method of using foils when preparing frozen foods.

Members of the Frozen Food Council of Southern California cooperated by supplying items of frozen foods to be used as display and for demonstration by Miss Penny. All of the members of this council could not be asked to participate; however, those who were approached lent their whole-hearted cooperation. Some of the frozen foods shown were turkey, chicken, an attractive display of

CLEVELAND CHAPTER PICNIC

The Cleveland Chapter picnic was held at Bittner's Rock Haven. A variety of games and tournaments highlighted the affair, one of which was a rolling-pin throwing contest with a dummy for the target. Miss Phyllis Dicee, Chardon, Ohio, was the winner. Her prize was a shoe rack, donated by Paul Spring, President, and made of copper tube and sweat fittings. The rack, after fabrication, was chrome finished and made a very attractive gift. The horseshoe contest was won by Roy Antoko and his prize was a mounted horseshoe.

The group picture in the left-hand column shows the entire attendance at the picnic.

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vegetables, shrimp, pies, "Whip-Topping," pineapple, cocoanut, an assortment of fruits, orange juice, several seafoods, chili con carne, strawberries, dates, frozen coffee, frozen cookies and coffee rolls, and frozen cakes.

These frozen foods were held in a 12-foot Weber roll-top case and an Admiral Dual-Temp refrigerator. Those foods which Miss Penny had cooked before the meeting were on display during her talk; and as she mentioned some of the items which she had not prepared, she removed samples from the refrigerators.

The meeting was held at the Rodger Young auditorium and after a very excellent dinner and after Miss Penny's very interesting talk, six cakes were cut and served with coffee. These cakes had been held in a frozen condition for over 30 days and thawed that morning. The coffee was furnished by the Cusack Coffee Co., who markets a concentrated coffee in a frozen state. It was felt that the serving of this cake and coffee which had been held in a frozen state for a long period of time was an excellent climax to the meeting. As the guests finished this "snack" they were invited to interview Miss Penny personally.

A view of those in attendance at the Los Angeles Chapter dinner is at the left.

PAST PRESIDENT E. A. PLESSKOTT RECEIVES PLAQUE

IN APPRECIATION of his services to the Refrigeration Service Engineers Society during his term of office as its International President from January, 1941 to January, 1945, Past President E. A. Plesskott, St. Louis, Mo., was the recipient of a beautiful bronze plaque from the members of the Association at their 9th Annual Convention in Cleveland.



In making the presentation at the Annual Banquet October 28, Past President Gordon Burns, Toronto, Canada, paid tribute to the accomplishments of Mr. Plesskott's administration and stated "that much of Mr. Plesskott's service was performed during the critical war years and his conduct of the Association affairs during this time was responsible for the effectual work the Society accomplished in cooperation with other industry organizations and governmental departments in maintaining vitally needed refrigeration equipment in support of the 'all out' war effort."

Plaque presented to
E. A. Plesskott

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ADAPTING AIR CONDITIONER

(Continued from page 27)

satisfactory with a conditioner where air flow is not required for ventilation except when heat is required. A better method, usually, is to use a thermostatically operated steam or water valve to the coil. There is a wide variety of these valves on the market. A very desirable type has two thermostatic bulbs, one placed in the conditioned room or return air duct, which can be set for the desired temperature, and the other at the supply air duct or grille, set to the maximum temperature at which air should be supplied.

The one pipe system of steam distribution usually lends itself better to full on and full off operation than to proportioning. If a proportioning valve is placed in the steam inlet a check valve must be placed in the return as shown in Fig. 5.

Summarizing, summer air conditioning equipment can be adapted to winter conditioning by the installation of a steam or hot water coil in the air stream, with thermostatic control of steam, water or air supply. A simple humidifier can be added, either to the conditioner or placed in the conditioned space, if desired, controlled by a humidistat. Water coils should be connected with minimum resistance to water flow; steam coils with provision for draining condensed water from all parts without blowing steam.

* * *

MOBILE REFRIGERATION

(Continued from page 36)

sheave to overrun the shaft of the motor, and when the compressor is being driven by the motor, the clutch will permit the shaft to be overrun."

Of importance, as the patent states: "the axis of the shaft of the compressor and the driven shaft of the speed reducer are crosswise of the vehicle, or normal to the propeller shaft of the vehicle. This minimizes vibration. It will also be noted that the speed reducer is mounted to one side of the propeller shaft, while the compressor is mounted on the opposite side of the propeller shaft. This gives a balancing effect and also minimizes vibration."

In road use, when the unit is operating from the motor vehicle, the unidirectional clutch permits the device to turn freely, without revolving the rotor of the motor. Likewise, when the unit is operating from plug-in on the motor, the clutch permits the compressor to run without producing any torque on the driven shaft of the motor vehicle.

Concluded

GETTING DOWN TO BUSINESS

(Continued from page 29)

the big time. It's being done, you know.

The very growth in number of independent service men in the last ten years, from 6,000 to 20,000, should prove something to you. It should show you that thousands of other fellows have made the grade on an independent, neighborhood basis. How about you?

The very fact that manufacturers are turning, in increasing numbers, to the independents to service the nation's refrigerators should also give you courage. And bear in mind that the increase in numbers of makes and models that is occurring right today argues for more and more independent service work.

You are in a fast-moving industry, mister, one that can and should be netting you a tidy income—*IF you don't wear blinders.*

* * *

QUESTIONS AND ANSWERS

(Continued from page 32)

it keeps the pressure within the liquid line high enough so that there is not sufficient expansion of the gases to cause sweating or frosting of the line. There is no adjustment of the valve and it has nothing to do with temperature or any other function of the refrigerator.

Those units equipped with a high side float would have flooded type evaporators which are not suitable for operation with an automatic expansion valve. The expansion valve will not operate satisfactorily with any but a continuous tube type evaporator. The flooded type evaporators are suitable for either high side floats or capillary tubes.

* * *

BOOK REVIEW

(Continued from page 66)

for individual reference purposes in the choice of a career.

The manuscript for this monograph was written by a qualified expert and was carefully designed to supply the following authoritative, factual information under normal conditions: Personal qualifications required for engaging in the work; Scholastic training needed; Complete analysis of employment opportunities; Remunerations received; Chances for advancement; Frank statement of advantages and disadvantages; Possibilities for both men and women in the vocation or profession.

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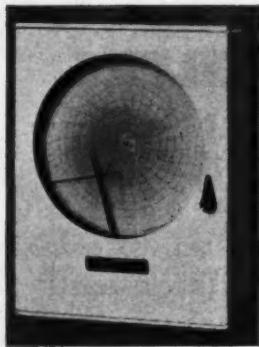
New and Improved Appliances

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Thermometer

DEVELOPMENT of a new recording thermometer designed specifically to meet the requirements of refrigerated locker plants has been announced by the Minneapolis-Honeywell Regulator Company.

The instrument covers a 100-degree temperature range from 30 degrees below zero to 70 degrees above and is equipped with a seven-day chart, G. M. Kingsland, manager of the company's specialties division said. Using a mercury filled thermal system, the new thermometer permits evenly spaced chart graduations over its entire range, thus providing for easier and more accurate readings.



To comply with various state laws, the thermometer may be operated either by an electrical or hand wound clock mechanism, Kingsland stated. Some states, he pointed out, require hand wound mechanism so the thermometer will not be affected in event of an electrical power failure. A smooth white enamel case makes the thermometer easy to clean.

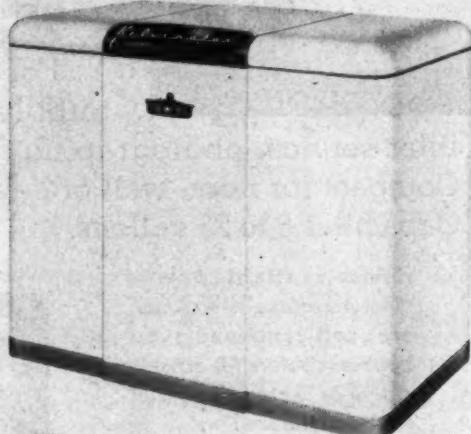
The thermometer was jointly developed by Honeywell's Brown Instrument Division,

which specializes in precision industrial controls and the company's specialties division. A reverse reading chart is optional for locker plant operators who desire temperature recordings nearer to the perimeter of the chart. This, it was pointed out, facilitates visual readings because the recorded temperature line for any given period of time covers a greater distance than a similar line drawn nearer to the center of the chart.

Charts are quickly and easily replaced simply by fitting them over the turn-table in much the same manner as a record is placed on a phonograph.

Kelvinator Freezer

KELVINATOR'S new six-cubic-foot home freezer, now in production, will retail for \$199.50, according to Charles T. Lawson, vice-president of Nash-Kelvinator Corporation in charge of Kelvinator sales.



Trimly styled and engineered for beauty and maximum storage space, the Kelvinator home freezer will hold more than 210 pounds of frozen foods. It is 36 inches high—table height—with its easy accessibility stepped up by a full-width lid, safety-fitted with a convenient trunk-type support. The cabinet is 39 inches wide and 23 inches in depth. Lift-out racks are a convenient accessory. Finish is lustrous white, with chrome and grey trim.

The interior is divided into two sections by a removable metal grid. The bottom surface of the smaller section is refrigerated to provide extra-fast freezing. The section may also be used for storage. The remainder of the storage space in the cabinet is maintained at an average of zero for long-range food protection.

Many of its features reflect Kelvinator's thirty years as a leading manufacturer of low temperature cabinets, and the new freezer has the same basic construction as Kelvinator ice cream cabinets. It has a one-piece welded exterior of rust-proof steel, with thick Fiberglas insulation completely sealed in. Walls have four inches of Fiberglas, while the lid has 2½ inches. Like the ice cream cabinets and refrigerators, the freezer is powered by Kelvinator's sealed Polarsphere condensing unit.

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Eskimo Freeze

A HOME freezer unit utilizing corrosion resisting and temperature conductivity properties of aluminum and called the "Eskimo Freeze," is now being produced by Reynolds Metals Co., according to announcement by W. G. Reynolds, vice president in charge of the company's Parts Division. This is the first item in a line of refrigerating equipment.

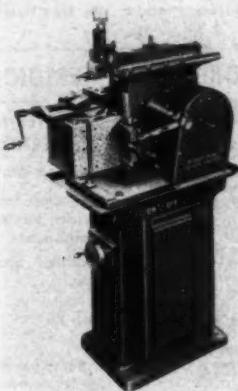
The Reynolds Eskimo Freeze has a food storage space of 6 cu. ft. and is designed to meet the needs of the average household. It is 36 in. high, 40 in. long and 28 in. deep front to back, takes up little space and has an easy lift top for access to the storage compartment. This freezer is equipped with a 1/5 h.p. hermetically sealed unit that insures extra capacity to take care of any loads imposed upon it. "Freon 12" refrigerant is used in this unit.

The weight of the entire cabinet is 185 lbs. At present the Reynolds Eskimo Freeze is available in natural aluminum or white enamel finish.



New Shaper

PRODUCTION of a new 7-inch Shaper of advanced design is announced by Logan Engineering Company,



Chicago. A companion item to the Logan Lathe, the new Shaper is quickly and easily set up to handle a wide variety of work, including straight cuts, angular cuts,

squaring, machining and slotting operations. Built entirely of steel and cast iron, with extra weight at vital points, and rugged throughout, the Logan Shaper is said to take heavier cuts smoothly, with speed and accuracy, and without chatter. An extra heavy cast iron crank plate, for example, puts ample power behind every stroke. Positive, slip-proof operation, even on heavy cuts, is further assured by the roller chain drive. A maximum stroke of 7 $\frac{1}{2}$ " and any desired operating speed between 64 and 175 strokes per minute are stated to make the Logan Shaper outstanding in capacity and versatility as well as in accuracy. The speed can be changed instantly, without stopping the motor or shifting the belt. The ram is micro-set by a simple screw adjustment. There are six automatic feeds in either direction from .002 to .012, with a half turn of the feed handle reversing the feed. The tool head may be swiveled and instantly re-set to center by means of tapered locating pins, an exclusive Logan Shaper feature, according to the designers. Distribution of the new Shaper will be handled exclusively by established Logan Lathe dealers.

Thermometer

A NEW Marsh "Service-man" Thermometer is now available in a -30° to 65° F. temperature range to meet freezer servicing requirements.



A timely addition to the established Marsh "Service-men" line of test thermometers, this unit provides a means of checking temperature conditions inside the box

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from a point outside with the cover or door closed.

The new "Serviceman" has a sturdy all metal case, heavy duty movement, unbreakable crystal and mar-proof, non-slipping rubber suction cup feet. It is also equipped with the Marsh "Recalibrator" to re-adjust the unit in case it is knocked out of calibration under abnormal field punishment.

Ben-Hur Freezer

PRODUCTION of a new 12½ cu. ft. capacity DeLuxe Model Ben-Hur Farm and Home Freezer is announced by the Ben-Hur Mfg. Co. of Milwaukee. Among the unique features of this new model is the lining of gleaming stainless steel, adding as it does a touch of sheer beauty. This stainless steel inner lining can never rust or stain. The cover has been designed with debossed reinforcing ribs in the shape of a huge "X." This adds greater strength as well as attractive appearance to the cabinet.

With a freezing compartment of 3.7 cu. ft., and a frozen storage compartment of 8.8 cu. ft., having a capacity of approximately 630 lbs. of frozen foods, the new model provides home freezer service for the family of average size or larger. The separate freezing compartment in their 12.5 cu. ft. unit is a highly important feature, as it prevents the latent heat of fresh foods from affecting the temperatures of the foods in the frozen storage compartment.

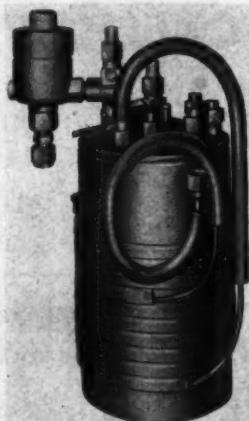
The flat top provides the housewife with an additional working surface when need-

ed. The cabinet was also designed at a height that compares with kitchen tables and workboards, hence it fits with the other features of a modern home kitchen. Cabinet corners are rounded, but not extremely so.

Dimensions of the Ben-Hur DeLuxe Model are 28½ inches wide, 63 inches long, and 36 inches high. Weight is approximately 565 lbs.

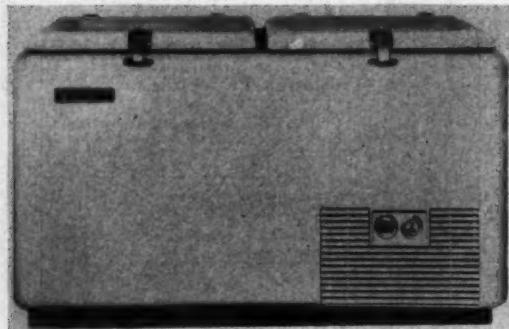
Cooler

STAINLESS steel beer coils are now being used in a new model draught beer cooler manufactured by Tem-



prise Products Corporation, 45 Piquette Avenue, Detroit 2, Michigan.

Draught beer will draw in a perfectly clear condition through oval-shaped stainless steel coils from the first day



of use, it is contended, for the beer will not become clouded upon contact with new stainless steel. The so-called beer-stone formation, which builds up on the inner coils after the first three or four days use, customarily acts as a protective coating, preventing beer cloudiness by actually keeping the beer away from direct contact with the coils. However, it is unnecessary to wait for the beerstone to form on stainless steel coils because beer has no undesirable reaction from contact with stainless steel, according to the maker.

Possessing a high degree of tensile strength, stainless steel also presents a uniformly smooth surface, is virtually non-porous and is thereby easy to clean and keep clean. It is further maintained that this metal offers, for all practical applications, a permanent type of installation.

Operating on a principle of direct heat transfer, the unit is equipped with an internal low-side float valve refrigerator feed, and a constant-pressure, temperature-control valve. Temperature control, said to be highly accurate, will maintain a uniform 40 degrees at the heaviest loads. The cooler will draw up to three different brands of beer plus sweet water and soda water, all cooled at the same time. Water coils are made of hot tinned, dipped copper.

Two models, 8" in diameter by 15%" overall height and 8" diameter by 18" overall height, are available.

Condensing Unit

NEW open type condensing units, for use on a wide variety of refrigeration equipment, have been added to the line of products Jack & Heintz Precision Industries, Inc., is developing for the refrigeration field, according to an announcement by the company.

This is the second refrigeration product released by the engineering laboratories of Jack & Heintz within three months. In July the company announced the development of a hermetic compressor, weighing approximately $\frac{1}{4}$ of conventional models, for use in home refrigerators up to 9 cubic feet in size. Both type units—the "open" and the "hermetic"—were shown

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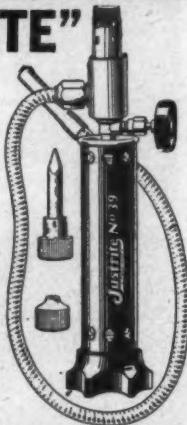
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publicly for the first time at the All-Industry Show in Cleveland.



Production of the open type condensing units, in $\frac{1}{4}$ and $\frac{1}{2}$ horsepower models, is scheduled to get under way before the first of the year. Production tooling for the hermetic compressor is progressing satisfactorily.

Regarding the open type condensing units, the company pointed out that undivided responsibility of one manufacturer on such components as motors and compressors is expected to simplify service problems on equipment and to expedite a more rapid production schedule as current material shortages become relieved.

Frosted Food Cabinet

THE Paley Manufacturing Corp. of Brooklyn, N. Y., has produced a new line of Self-Service Frosted-Food Cabinets. Available in Center

The cabinet liners used for cooling are specially fabricated serpentine Kold-Hold plate type evaporators designed for sharp freezing and for holding frozen foods and perishables at desired low temperatures. Each cabinet has a 20 cu. ft. capacity Kold-Hold liner with grey infratex baked enamel finish and a sheet-steel bottom. Standard refrigeration connections for the liners are $\frac{1}{4}$ " O. D. copper tubing, brazed into steel tube elbows. The refrigerant may be either methyl chloride or "Freon."

The serpentine line (one side embossed, other side flat) allows the refrigerant free circulation through all tubes, and keeps oil from logging. The flat side is mounted, facing in, providing continuous unbroken flats for maximum cooling contact. This type of Kold-Hold plate construction eliminates internal tubing and refrigeration joints, substantially reducing the weight.

The overall dimensions of the Paley wall type food cabinet are: Length 84 inches, height 75 inches, and width 33 inches. The center aisle cabinet has the same base dimensions and is 62 inches high. The superstructure is removable for shipping.

Other features of the Paley cabinets are the white enameled 14 gauge steel cabinet case with welded, rust-proof,

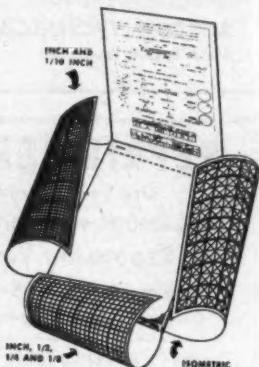


Isle and Wall Type Models, the cabinet performs a highly efficient cooling job and makes an attractive display unit.

moisture-proof seams; plate glass mirror for extra display; indirect, non-glare fluorescent lighting; and low compressor capacity.

Jiffy Sketch

JIFFY SKETCH is the name of a scale drawing pad that is being introduced by Jiffy Sales Co., Cleveland. It enables one to make properly proportioned drawings without use of ruler, drafting board or T-square, and it may be used in the shop or in the field as easily as in the office.



The Jiffy Sketch pad contains 75 sheets of high quality tracing tissue, enclosed within a cover jacket that consists of four cardboard flaps. Various scales are printed on three of the flaps. To use the pad, you simply fold back the cover flap and then place one of the tissue sheets over the scale you wish to employ. Your drawing is made accurately to scale with the aid of the printed lines which show through the tissue.

In many respects the Jiffy Sketch pad is superior to graph paper. Drawings made on this pad may be blueprinted. There are no ruled lines on the tissue to confuse the drawing. It gives all the advantages of ruled paper, with none of the disadvantages.

The pad measures approximately 9 by 12 inches. Sheets are perforated for easy removal. Valuable information is printed on the back of each cover flap—basic mechanical drafting standards; electrical, welding and architectural symbols; decimals of a foot; decimal equivalents of fractions, with circumferences and areas of circles.

Jiffy Sketch will be on sale at most dealers.

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NEW SALES MANAGER FOR IDEAL

WARD R. SCHAFER, nationally known electrical appliance sales executive, has been named general sales manager of Ideal Industries, Inc., Sycamore, Illinois, manufacturer of electrical and mechanical industrial equipment. This is announced by J. Walter Becker, president of Ideal. Mr. Schafer leaves his post of vice president in charge of sales of Edison General Electric ("Hotpoint") Appliance Company in Chicago for the new position, effective November 1.

Except for two of the war years when he supervised construction of a \$6,000,000 power plant for the Defense Plant Corporation in connection with the government synthetic rubber program, Mr. Schafer served with the appliance company from 1924 until the present time.



W. R. SCHAFER

In announcing Mr. Schafer's appointment, Mr. Becker said that Ideal, which operates on a jobber basis, distributing its products through leading wholesalers in all parts of the United States, has embarked on an important expansion program. The program includes new buildings, additional machinery, and an expanded marketing program to take care of increased production.

C. D. OTTERSON, SALES MANAGER FOR BONNEY FORGE

F. S. DURHAM, F. president of Bonney Forge & Tool Works, Allentown, Pennsylvania, announces the appointment of Charles D. Otterson as sales manager.

Mr. Otterson brings to this company a wealth of experience in many varied fields of sales and other activity.



C. D. OTTERSON



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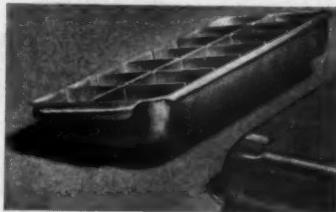
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NUSSBAUM TO HEAD KRAMER RESEARCH

O. J. NUSSBAUM, who during the war, acted as Chief Engineer of the Kramer Trenton Company, manufacturers of heat transfer products, is again devoting his full time to research and development of new equipment for that company.

Mr. Nussbaum is in full charge of the company's laboratory which has recently been extended to include a fully equipped low temperature testing station. His duties will include supervision of equipment, testing, refrigeration research and the development and design of new products.

A graduate engineer, Mr. Nussbaum attended various colleges in the United States and abroad. He has been associated with the Kramer Trenton Company since 1939.



O. J. NUSSBAUM

R. A. JOHNSON WITH BETZ

RUSSELL A. JOHNSON is now associated with the Betz Corporation of Hammond, Indiana, manufacturers of commercial refrigeration cooling units, as assistant chief engineer.

During the war Mr. Johnson acted as production engineer in aircraft engine manufacturing for the Dodge - Chicago Division of the Chrysler Corporation, where he was engaged in development work on critical aircraft engine gears. During the latter part of the war, he did field engineering work for Dodge covering B-29 manufacturing plants and bases.

Mr. Johnson comes to the Betz Corporation from Frigidaire Sales Corporation of Chicago, where he had charge of engineering of air conditioning and commercial refrigeration installation.



R. A. JOHNSON

PENN PROMOTES CAMERON TO V.P.

D. G. CAMERON, who joined Penn Electric Switch Co., Goshen, Indiana, two years ago as Chief Engineer, was recently elevated to vice president in charge of manufacturing. Cameron's new assignment embraces the manufacturing operations of Penn's Goshen, Canadian and Indianapolis factories.

He will coordinate the functions of manufacturing, production, engineering and plant engineering.

Fred W. Hottenroth was recently appointed chief engineer.

Hottenroth, who joined Penn approximately a year ago as assistant chief engineer, succeeds D. G. Cameron. As chief engineer, he will be responsible for engineering, design, drafting, laboratory, model shop and specifications department.

C. J. OLIN MOVES TO COAST

CARL J. OLIN, western manager for the Electric Refrigeration Division of Servel, Inc., is moving his headquarters from Evansville, Indiana, Servel's home office, to Los Angeles. The change is effective November 1, according to Geo. S. Jones, Jr., vice-president in charge of sales.

Mr. Olin will be responsible for sales activities in all states west of the Rocky Mountains. Customers in the mid-west and southwest will be handled by present district managers, supervised by W. J. Aulsebrook, sales manager.

A native of Los Angeles, Mr. Olin started with Servel as a field service engineer, covering the west coast territory. In 1928 he was transferred to Evansville as assistant service manager.

Since then he has been successively service manager, applications manager, national accounts manager, assistant sales manager, and about a year ago, western manager. He became a member of Servel's Twenty-Year Club last March.

Mr. Olin is an associate member of the Refrigeration Equipment Manufacturers Association, American Society of Refrigeration Engineers, and the Refrigeration Service Engineers Society.



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G.E. PURCHASES PLANT IN FT. WAYNE

FRACTIONAL-HORSEPOWER motor production facilities at General Electric have been increased with the purchase from the Reconstruction Finance Corporation of the big Ft. Wayne, Ind., plant where the company manufactured turbosuperchargers during the war. G.E. paid \$5,000,000 for the plant, according to the company's announcement.

It is expected that more than 3,000 persons will be employed at this location as soon as installation of production lines is completed. For the past several months the plant has been in limited operation, employing upwards of 700 persons.

NEW BONNEY CATALOG

BONNEY FORGE & TOOL WORKS, Allentown, Pa., announce their new 46R refrigeration catalog just off the press containing Bonney refrigeration mechanics hand tools and sets for refrigeration servicing and repair work.

It is an 18-page book illustrating and describing, in the first section, the method of manufacturing the tools. The balance of the book is devoted to a convenient to use listing of tools used in refrigeration service work.

HARRY ALTER CATALOG

THE Harry Alter Co. is pleased to announce that their new fall and winter catalog No. 142 has just come off the presses. This catalog is the third issue published this year, and has 186 pages full of refrigeration and air conditioning parts and supplies; an 8-page increase over their last catalog.

Many new lines and new items have been added, along with the latest price revisions.

There is an 8-page colored section in the center of the catalog, featuring only surplus bargains.

If you haven't received your copy yet, just write for it on your letterhead to The Harry Alter Co., 1728 S. Michigan Ave., Chicago 16, Ill., or to their New York branch at 134 Lafayette St., New York 18, N. Y.

LATEST REMPE CATALOG

CONCISE, clear tables and complete refrigeration data as well as complete engineering information are contained in the new illustrated catalog No. 120 on fin coils and custom built air conditioning units for

low temperature cooling, just published by Rempe Company, 340 No. Sacramento Blvd., Chicago 12, Illinois.

Refrigeration engineers will find this catalog an aid in selecting proper coils for such installations as walk-in coolers, display cases, florist boxes and air conditioning. Specific information as to length of case, fin space, number of coils required, overall dimensions, surface in square feet, Btu. capacity per hour per degree, shipping weights and prices, are all included in the new catalog.

NEW COLD PLATE CATALOG

A NEW post-war plate catalog containing valuable technical information regarding modern methods of refrigeration has been published by The Standard-Dickerson Corporation of Newark, N. J., it has been announced by Victor J. Moss, director of sales of the corporation. The catalog, entitled, "The A.B.C. of Standard Prime Surface Cold Plates," contains 36 pages and is described as "A Handbook for Manufacturers and Distributors of Refrigeration Equipment." A copy of the catalog may be secured by writing to The Standard-Dickerson Corporation, Newark 5, N. J.

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, and March 3, 1935, of THE REFRIGERATION SERVICE ENGINEER, published monthly at 435 North Waller Ave., Chicago 44, Ill., for October, 1946.

State of Illinois, Cook County, ss: Before me a Notary Public in and for the State and county aforesaid, personally appeared H. T. McDermott, who having been duly sworn, according to law, deposes and says that he is the Editor and Publisher of THE REFRIGERATION SERVICE ENGINEER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, to-wit, by the 1st of August, 1946, and March 3, 1935, embodied in section 433, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, Nickerson & Collins Company, Chicago, Ill.; Editor, H. T. McDermott, Oak Park, Ill.; Managing Editor, H. D. Bush, Elmhurst, Ill.; Business Manager, L. R. Townsley, Chicago, Ill.

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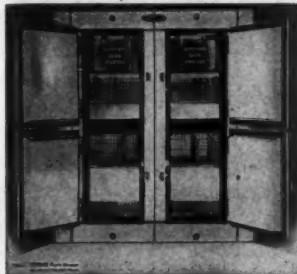
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(Signed) H. T. McDERMOTT,

Editor and Publisher.

Sworn to and subscribed before me this 27th day of September, 1946. Helen G. Smith, notary public. [Seal.]
(My commission expires June 21, 1948.)



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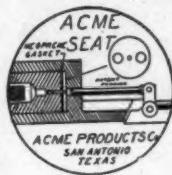
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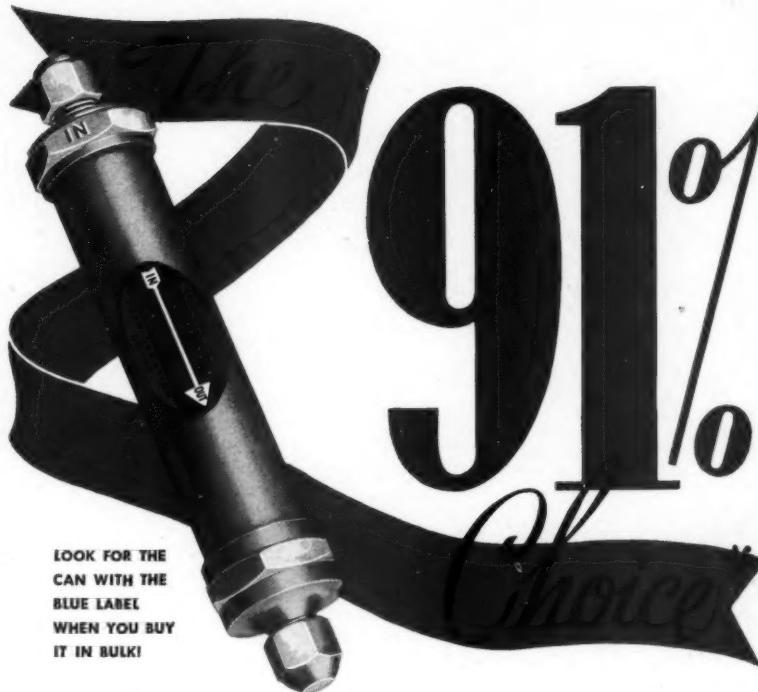
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